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July 30, 2009

Waters, McPherson, McNeill
300 Lighting Way
P.O. Box 1560
Secaucus, New Jersey 07096

Attn: Steven Gray, Esq.

Re: *Expert Report*
KIA Site (former site of AMMCO operations)
65 Passaic Avenue
Kearny, New Jersey
TRC Job No. 1894-154733

Dear Mr. Gray:

On behalf of Goldman/Goldman/DiLorenzo a.k.a. GHC Holdings in Liquidation, TRC Environmental Corporation (TRC) has prepared the attached *Expert Report* for the above-referenced property (Site). The attached report has been prepared by TRC in light of the recent U.S. Supreme Court decision in *Burlington Northern & Santa Fe Railway Co. v. United States.*

If you have any questions or need additional information, please call.

Very truly yours,

TRC Environmental Corporation

Kenneth Siet
Vice President

Nidal Rabah, Ph.D., P.E.
Director of Engineering

458616

EXPERT REPORT
KIA Site
(former site of AMMCO operations)
KEARNY, NEW JERSEY

TRC Job No. 1894-154733

Prepared for:

Waters, McPherson, McNeill
300 Lighting Way
P.O. Box 1560
Secaucus, New Jersey 07096

Prepared by:

TRC Environmental Corporation
57 East Willow Street
Millburn, New Jersey 07041

July 30, 2009

EXPERT REPORT
KIA SITE
(FORMER SITE OF AMMCO OPERATIONS)
KEARNY, NEW JERSEY

EXECUTIVE SUMMARY

On behalf of Goldman/Goldman/DiLorenzo Properties Company, a.k.a. GHC Holdings in Liquidation, TRC Environmental Corporation ("TRC") has prepared this report concerning environmental impacts associated with operations at the Kearny Industrial Associates, LLP (KIA) property including the site of the American Modern Metals Company ("AMMCO") facility in Kearny, New Jersey ("Site").[1] The USEPA and NJDEP have alleged that operations at the Site have impacted the Passaic River and its natural resources. The Site is approximately 7 acres in size with Passaic Avenue dividing the Site into two separately owned properties. It includes the 5.7-acre parcel, which KIA currently owns on the east side of Passaic Avenue, and the 1.3-acre parcel, which it previously owned (and sold in 2001) on the west side of Passaic Avenue adjacent to the River. AMMCO's operations were conducted on the east side of Passaic Avenue.

Specifically, TRC's Report evaluates potential Site impacts to the adjacent Passaic River, determines that Site impacts are divisible, and provides a reasonable basis to allocate potential natural resource damages (NRD) which may be associated with the Site.

Similar to many other sites located along the banks of the Passaic River, the Site appears to have been created by filling in low lying areas with man emplaced historic fill material. Typically, historic fill is composed of cinders, ash and other debris, and inherently contains various metals and polycyclic aromatic hydrocarbons (PAHs).

AMMCO operated at the 7-acre Site from 1959 to 2004. Extensive environmental investigations conducted by TRC under the supervision of the New Jersey Department of Environmental Protection ("NJDEP") pursuant to the Industrial Site Recovery Act ("ISRA") NJSA 13:1K-8, have shown that any accidental releases of pollutants from industrial operations which may have occurred at the eastern portion of the Site (current KIA property), have been contained on the Site. There were no direct industrial wastewater discharges to the Passaic River from the Site, and the Remedial Investigation confirms that the River was not adversely impacted by any spills at the Site. The various environmental investigations at the Site reveal that storm water runoff contacting the historic fill at the Site was the source of any associated potential impacts to the adjacent Passaic River. Storm water runoff from the Site could have reached the River through overland flow or the combined sewer system which serves the Site and nearby community.

The Passaic River is located in one of most densely populated areas of the country and has a long history of commercial uses dating back to colonial times. Over the decades industrial, commercial and residential communities expanded throughout the River's watershed. These users relied on the River as a source of water and an area of discharge for waste waters and storm water. The waterway has been degraded by diffuse anthropogenic (i.e., caused by man) sources of pollution including storm water runoff, and other sources. Both the NJDEP and US

[1] Goldman/Goldman/DiLorenzo Properties Company (DiLorenzo Properties) and then DiLorenzo individually owned the Site from 1959 to 1992.

Environmental Protection Agency ("USEPA") are currently evaluating the environmental status of the River pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the New Jersey Spill Compensation and Control Act to recover costs associated with the investigation and anticipated remediation and restoration of the River and potential NRD associated with past discharges. A large number of potential responsible parties (PRPs) with facilities located immediately along the river have been identified and put on notice by the federal and state environmental regulatory Agencies. In regard to the Site, the current owners (KIA, S&A Realty), a prior industrial operator (AMMCO) and a former owner (DiLorenzo Properties) have all been named as PRPs by USEPA and NJDEP.

In 1980 Congress passed the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), 94 Stat. 2767, as amended, 42 U. S. C. §§9601–9675. The Act was designed to promote the cleanup of contaminated sites and to ensure that the costs of such cleanup efforts would be borne by those responsible for the contamination. CERCLA provides for strict liability. Under CERCLA, apportionment is proper when the evidence supports the divisibility of the damages jointly caused by the PRPs.

In May 2007, in the context of initial discussions in the KIA Bankruptcy to resolve cleanup asserted by USEPA/NJDEP, an expert report was prepared by Conestoga-Rovers & Associates ("CRA") on behalf of S&A Realty to assess the potential range of natural resource damages ("NRD") due to the potential contribution of historical impacts from the Site to the Passaic River. The CRA Expert Report also concluded that any impacts from the Site on the River were associated with storm water runoff from the Site. The CRA Expert Report projected NRD damages within an extremely broad cost range based upon the assumption that the entire Site has always been undeveloped with unpaved surfaces susceptible to storm water runoff. Obviously this is not the case. Therefore, in this report, TRC quantifies these historic fill impacts.

Subsequent to the CRA Expert Report, the Supreme Court of the United States affirmed the applicability of apportionment in CERCLA response actions in the case of BURLINGTON NORTHERN & SANTA FE RAILWAY CO. ET AL. v. UNITED STATES ET AL. (Burlington). In Burlington, the Court upheld the accepted position that apportionment is proper when "there is a reasonable basis for determining the contribution of each cause to a single harm." Concerning CERCLA cost recovery, the Court specifically referenced the long accepted concept of apportionment as provided in the Restatement (Second) of Torts "*..when two or more persons acting independently cause a distinct or single harm for which there is a reasonable basis for division according to the contribution of each, each is subject to liability only for the portion of the total harm that he has himself caused*". Also affirmed in the Court's opinion was the opinion on the subject of apportionment in CERCLA actions was written in 1983 by Chief Judge Carl Rubin of the United States District Court for the Southern District of Ohio. Chief Judge Rubin concluded that although the Act imposed a "strict liability standard," it did not mandate "joint and several" liability in every case. Rather, Congress intended the scope of liability to "be determined from traditional and evolving principles of common law".

Given the recent Supreme Court decision in Burlington, TRC has reviewed extensive Site documents including aerial photographs and historical Sanborn fire insurance maps dating back to 1900. These sources of information were used to determine the amount of exposed historic fill material on each of the two parcels. Based on current data, and considering costs of both active remediation of River sediments and NRD, TRC has concluded that the potential impacts

fill material on each of the two parcels. Based on current data, and considering costs of both active remediation of River sediments and NRD, TRC has concluded that the potential impacts to the Passaic River that may be associated with the Site, are divisible.

The extensive environmental investigations conducted at the Site have provided sufficient data to characterize environmental site conditions. The mechanisms of evaluating storm water runoff are well understood and were used to quantify the potential impacts to the River. The impacts to the River from the Site can be quantified by calculating the volume of sediment loading in the stormwater runoff (using Site-specific sampling results), which would have been impacted by historic fill constituents before flowing into the Passaic River. Determining the mass of eroded historic fill carried by the stormwater runoff and knowing the concentration of the various contaminants within the historic fill provides a reasonable basis to apportion the overall contaminant load to the Passaic River from the Site and allows for the apportionment of liability to the Site both in terms of costs of remediation and NRD.

Using the Universal Soil Loss Equation, a standard method for this type of evaluation, TRC estimated that the total sediment loading that could potentially have been released from the Site to the Passaic River was approximately 1,000 kilograms per year. This was compared to sediment and contaminant loadings known to exist throughout the Passaic River to evaluate NRD liability and to develop a reasonable restoration cost estimate for an equivalent compensatory habitat. TRC estimated total remediation/NRD damages by calculating the cost of active remediation (removal/disposal of the Site - related contaminated sediments from the Passaic River) and compensation for service loss (based upon a Habitat Equivalence Analysis) due to injuries until the River is restored to baseline conditions. To calculate total impacted sediments and restoration costs, TRC assumed that historic fill was emplaced at the site in approximately 1900 and releases of contaminated sediment to the Passaic River through the stormwater runoff pathway would continue until 2012 (*i.e.,* until the Site is fully remediated and developed). For NRD purposes, TRC assumed an injury period between years 1981 (the Statutory start date for Federal NRD loss of use calculations) and the end of 2012 (*i.e.,* when Site is fully remediated and developed and sediment transport to the River is eliminated).

Using a conservative annual discount rate of 3%, the total projected Passaic River liability for the Site is $193,000[1]. This includes both NRD and remediation costs (with a 20% contingency) associated with Site impacts to the Passaic River. TRC's projected remediation includes the cost to remediate through removal (dredging and off-site disposal) of the contaminated Passaic River sediments associated with the Site. This removal of the contaminated sediments as proposed by TRC, would serve as a complete and comprehensive remedy for Site-related Passaic River impacts whether implemented as an Interim or Final Remedy.

In addition to the Passaic River impacts, TRC also evaluated potential groundwater NRD. The groundwater NRD liability was calculated to be approximately $45,000.

[1] Of this amount, the debtor's (i.e., KIA's) liability for its ownership and for AMMCO's operations was determined based upon the number of years after 1959 during which historic fill would be subject to stormwater runoff (i.e., from 1959 – 2013, the year when remediation of the Property is expected to be completed). This corresponds to an allocation ratio of 48%, or $92,200. The remaining 52% or $100,800 represents an "orphan share" for the period between 1900 and 1959.

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1.0 INTRODUCTION

On behalf of Goldman/Goldman/DiLorenzo Properties Company, a.k.a. GHC Holdings in Liquidation, TRC Environmental Corporation ("TRC") has prepared this report concerning environmental impacts associated with operations at the Kearny Industrial Associates, LLP (KIA) property including the site of the American Modern Metals Company ("AMMCO") facility in Kearny, New Jersey ("Site").[2] The USEPA and NJDEP have alleged that operations at the Site have impacted the Passaic River and its natural resources. The Site is approximately 7 acres in size with Passaic Avenue dividing the Site into two separately owned properties. It includes the 5.7-acre parcel, which KIA currently owns on the east side of Passaic Avenue, and the 1.3-acre parcel, which it previously owned (and sold in 2001) on the west side of Passaic Avenue adjacent to the River. AMMCO's operations were conducted on the eastern side of Passaic Avenue.

The Site was one of many sites named in the NJDEP Directive and Notice to Insurers ("Directive") In the Matter of the Lower Passaic River, which was issued by the NJDEP in September 2003. The Directive was issued for Natural Resource Injury Assessment and Interim Compensatory Restoration of Natural Resource Injuries.

In 2004, the USEPA issued CERCLA General Notice Letters to AMMCO, KIA, S&A Realty, and Marshal Clark Corporation in connection with its ordered Remedial Investigation/Feasibility Study ("RI/FS") of alleged contamination to the Passaic River and its natural resources. The members of a cooperative Group of PRPs has agreed to complete the RI/FS. DiLorenzo Properties, a former owner of the Site during a portion of the period during which AMMCO operated at the Site, joined the Group (on behalf of itself and the Goldman/Goldman/DiLorenzo partnerships) after AMMCO and its affiliate KIA refused to comply with the USEPA and NJDEP directives.

This Expert Report has been prepared by TRC to reflect the recent U.S. Supreme Court decision in *Burlington Northern & Santa Fe Railway Co. v. United States*, which opined that when a harm/injury is divisible, and there is a reasonable basis for apportioning that harm, a PRP should only be held responsible for its respective share of liability.

The extensive Site information demonstrates that there a reasonable basis to apply the apportionment of the harm potentially caused to the Lower Passaic River by operations at the Site, and that only a minimal amount of contaminants would have impacted the river from the Site. This is evident based on the following:

- The 7-acre Site is divided by Passaic Avenue, with the 5.7-acre "Eastern Parcel" located east of Passaic Avenue, and the remaining 1.3-acre "Western Parcel" located west of Passaic Avenue along the Passaic River. The Site, like many other sites along the Passaic River was built on reclaimed land comprised of historic fill.

[2] Goldman/Goldman/DiLorenzo Properties Company (DiLorenzo Properties) and then DiLorenzo individually owned the Site from 1959 to 1992.

- There were no land based disposal units on site (such as landfills, surface impoundments or other on-site disposal units).

- The Site is serviced by the Passaic Valley Sewerage Commissioners (PVSC), Newark, NJ. There were no direct industrial waste discharges to the PVSC sewer system or direct wastewater discharge points to the Passaic River from the Site.

- The only known spills at the Site occurred on the Eastern Parcel. While these spills did result in localized contamination the evidence from environmental investigations shows that the contaminants associated with these spills did not migrate across Passaic Avenue and the Western Parcel to the Passaic River.

- There were no known spills on the Western Parcel, which borders the Passaic River. As discussed below in Section 3.5, the entire Western Parcel contains historic fill material. The contaminants of concern detected on the Western Parcel are polyaromatic hydrocarbons ("PAHs"), which are attributable to the presence of the fill material.

- Storm water runoff from the Eastern Parcel flows into catch basins located along Passaic Avenue. These catch basins are part of the combined sanitary / storm water sewer system. On the Western Parcel, storm water runoff infiltrates into the ground in bare, unpaved areas and also flows overland to the Passaic River.

Therefore, the only pathways for contaminants to have entered the Passaic River from the Site are via overland flow of storm water from the bare, unpaved portions of the Western Parcel that may have come into contact with historic fill material or through storm water runoff into the combined sanitary/storm water sewer system from the Eastern Parcel. The contaminants inherent in historic fill material include certain metals and PAHs (see discussion below in Section 2.5).

TRC's findings contradict the "Discharge Liability" statement (#185) made in the Directive that hazardous substances were discharged at the Site and that those hazardous substances are emanating and/or have emanated into the Lower Passaic River. Based on TRC's review of the Site history, ISRA case file, NJDEP Historic Fill Database, and soil and ground water sampling results generated from investigations conducted at the Site for ISRA compliance, there is no indication that contaminants discharged on the Eastern Parcel migrated across Passaic Avenue to the Western Parcel and then to the Passaic River.

As discussed below, only a minimal amount of contaminants from the overland flow of storm water runoff that may have come into contact with historic fill material on the Site's Western Parcel could have made their way into the Passaic River. However, for the purpose of this analysis TRC's NRD calculations assume that storm water runoff could have entered the River from all of the bare unpaved portions of the two parcels at an average area of approximately 3 acres (the area of all bare, unpaved areas including those with stone, gravel or vegetated varied historically between approximately 2.5 and 3.25 acres of the 7-acre Site; the remaining 3.5-3.75 acres have been covered with buildings or have been paved).

This type of contaminant source is common and widespread due to the many other sites that contain historic fill material along the Passaic River (Appendix B).

2.0 BACKGROUND

2.1 Site Description

The former American Modern Metals Company ("AMMCO") facility is located at 65 Passaic Avenue, Kearny, Hudson County, New Jersey ("Site") (Figure 1). The surrounding land use is predominantly industrial and commercial with some residential properties located to the east. The 7-acre Site is divided by Passaic Avenue, with the 5.7-acre Eastern Parcel located east of Passaic Avenue (Block 14, Lots 3 and 4), and the remaining 1.3-acre Western Parcel located west of Passaic Avenue (Block 1, Lots 9 through 11) along the Passaic River (Figure 2). During AMMCO's tenure (1959-2004), the undeveloped Site area (no buildings or pavement) varied historically from approximately 2.5 and 3.25 acres with an average of approximately 3 acres, of which as much as approximately 0.75 acres to 1.3 acres were located on the Western Parcel.

2.2 Site History

Marshall & Co., Linen Thread & Twines reportedly owned the property from the early 1900s until 1959. The company manufactured linen thread, material and yarns from raw flax and twine, and sacks from raw hemp and jute. The property was purchased by York Associates (York) in October 1959 and Master-leased to Elite Industrial Park, Inc. (Elite). Under the terms of its master lease for the Site, the buildings were subsequently subleased by Elite to various industrial tenants including AMMCO. In September 1963, York transferred the property to Goldman, Goldman & DiLorenzo ("GGD") subject to the master lease with Elite. In 1974, Elite assigned the lease to its affiliate, E&P Enterprises Corp (E&P).

In February 1980, E&P sold and assigned the master lease to Airlite Aluminum Corporation, a predecessor of AMMCO. In May 1986, a fire in a boiler room located in a building on the Eastern Parcel destroyed some of the buildings on the Eastern Parcel.

In 1988, GGD transferred the property to DiLorenzo Properties. Airlite continued to lease the entire property and sublet portions of the property to AMMCO and to other tenants. The 1988 transfer of property triggered New Jersey's Environmental Cleanup Responsibility Act ("ECRA"), which was later amended and renamed the Industrial Site Recovery Act ("ISRA"). To comply with ECRA, nine Site Evaluation Submissions ("SESs") and a Phase I Sampling Plan were submitted to the NJDEP in June 1989 for the following nine industrial establishments that were subject to ECRA:

- AMMCO (ISRA Case Nos. 88785, 92264 and 20040144);
- RMS Sportswear, Inc. (ISRA Case Nos. 88786 and 92285);
- Marshall Clark Manufacturing (ISRA Case Nos. 88787 and 92286);
- H&G Industries (ISRA Case No. 88891);
- Endre Doczy (ISRA Case No. 88892);
- Ferber Plastics (ISRA Case Nos. 89A36, 89A39 and 92287);
- Jay Are Fashions Corporation (ISRA Case No. 89A37);
- C&J Custom Cycles (ISRA Case No. 89A38); and
- Top Notch Industry (ISRA Case No. 92284).

In 1992, DiLorenzo sold the property to Kearny Industrial Associates ("KIA"), which along with

its principals and its affiliate AMMCO assumed environmental responsibility for the Site. In connection with the ISRA case, AMMCO also substituted itself, its affiliates and officers on the surety bond which it forwarded to NJDEP to collateralize its Site cleanup obligation. In 2001, S&A Realty Corporation purchased the Western Parcel (Block 1, Lots 9 & 11). In 2004, AMMCO filed for bankruptcy protection, as did KIA in January 2007. As a result, GGD has been completing the remedial activities required to comply with ISRA for all of the above-referenced ISRA cases. See Section 3.7 below for additional information related to these ISRA cases.

2.3 Sanborn Map and Aerial Photograph Review

TRC reviewed Sanborn Fire Insurance Maps for the years 1907, 1950, 1985, 1991, 1993, 1994 and 1995 (Appendix A), and historical aerial photographs for the years 1940, 1951, 1961, 1974 and 1995 to obtain information regarding the operations at the Site.

1907 Sanborn Map

Eastern Parcel and Surrounding Properties

The 1907 Sanborn Map shows that the Site is occupied by *Marshall & Co., Linen Thread & Twines*. All of the buildings (i.e., Buildings 1, 2, 3, 4, 5, 8, 9, 11, 12, 13, 14, 15, 16, 17 and 18) associated with the production of linen are located on the Eastern Parcel.

Marshall Street borders the Eastern Parcel to the north; Clark Avenue to the east; Belgrove Drive to the south; and to the west is Passaic Avenue, Barber Asphalt Paving Co. and the Site's Western Parcel. The surrounding area is commercial and industrial.

Western Parcel and Surrounding Properties

The only two buildings (i.e., Buildings 19 and 21) located on the Western Parcel are labeled *Storage*. A small structure containing a vertical steam boiler and a derrick are located to the west of these buildings. A tunnel to the Eastern Parcel is present under Passaic Avenue.

The Passaic River borders the Western Parcel on the west; Passaic Avenue is east of the Western Parcel. The adjacent property to the south of the Western Parcel (owned by others) is *Barber Asphalt Paving Co.* with two oil tanks, a storage building, machine shop, melting furnaces, and a large building located on the western side of the Barber Asphalt property that contains three furnaces, an engine room, stone and sand heaters and a mixing room. A derrick is located on the Barber site along the Passaic River.

1940 Aerial Photograph

Eastern Parcel and Surrounding Properties

A large rectangular building (Building 22) covering the majority of the northeastern portion of the Eastern Parcel is now present. In addition, the four one-story buildings along the northern property boundary are no longer present. One large building (Building 24) is now shown in the same area. The surrounding area is residential, commercial and industrial.

Western Parcel and Surrounding Properties

A large building (Building 23) is now present west of Building 19.

The Barber Asphalt Paving Co. no longer appears on the property to the south. Approximately 11 above ground tanks are present directly across the Passaic River along its western bank.

1950 Sanborn Map
The Site is labeled The Linen Thread Co. Marshall Mill, Linen Thread and Twines.

Eastern Parcel and Surrounding Properties
A garage is now present to the east of Building 2. Building 22 is labeled *factory building*. Three unlabeled tanks are present to the east of Building 3. Building 24, first shown on the 1940 photograph, is labeled *waste storage* and *waste shaker*.

On a separate property owned by others, south of the Eastern Parcel, is a manufacturing building labeled *A.L. Wilson Chemical Co. - Mfg. of Dry Cleaners*. On the property adjacent to the south of A.L. Wilson Chemical Co. is a filling station.

Western Parcel and Surrounding Properties
A railroad spur off the Newark and Paterson Branch is present to the west of Building 23. The small boiler building and derrick are no longer present.

Four metal storage sheds are present along the northern property line of the former Barber Asphalt Paving Co. The oil tanks and engine room shown on the Barber site on the 1907 map are the only remaining structures on this property. The Harry Harris and Co. Iron and Steel Warehouse and a filling station are now present further south along Passaic Avenue.

1951 Aerial Photograph
The southeastern undeveloped corner of the Eastern Parcel appears to be used for parking. There are no other significant changes to the Site or surrounding area.

1961 Aerial Photograph

Eastern Parcel and Surrounding Properties
An aboveground tank and small building are now present adjacent to Building 2 on the northern portion of the Eastern Parcel.

Western Parcel and Surrounding Properties
Storage activities are present along the western portion of the Western Parcel.

The four metal storage sheds, oil tank and engine room located on the adjoining Barber Asphalt property to the south are no longer present. Two large commercial buildings are now present to the south. Three of the 11 above ground tanks located across the Passaic River are no longer present. There are no other significant changes to the surrounding area.

1974 Aerial Photograph

Eastern Parcel and Surrounding Properties
There are no significant changes to the Eastern Parcel.

A.L. Wilson Chemical Co. and the filling station shown on the 1950 Sanborn map are no longer present. In the same relative area is one commercial building and parking areas. A large commercial building is now present adjoining the Site to the north. There are no other significant changes to the surrounding area.

Western Parcel and Surrounding Properties
The storage activities shown on the 1961 photograph are no longer present. This portion of the Site now appears to be used for parking. There are no other significant changes to the Site.

One of the remaining 8 tanks located across the Passaic River is no longer present; however, 17 new aboveground tanks are now present in the same area. A large aboveground tank is also located north of the Western Parcel.

1985 Sanborn Map

The Site is labeled Elite Industrial Park, Inc.

Eastern Parcel and Surrounding Properties
Buildings 1 and 2 are no longer labeled. The dry room in Building 3 and the storage room in Building 9 are the only rooms labeled in the remaining buildings. The large tank shown on the 1961 photograph adjacent to Building 2 is identified as an oil tank. The two small buildings to the east of Building 8 shown on the 1950 map are no longer present. Building 8 is now labeled a commercial building. The southeastern portion of the Eastern Parcel is labeled parking.

The small building shown on the 1974 photograph on the adjoining property to the south is labeled a filling station. There are no other significant changes to the surrounding area.

Western Parcel and Surrounding Properties
There are no significant changes to the Western Parcel.

The two large buildings on the property to the south first shown on the 1961 photograph are labeled American Strip Steel, Inc. There are no other significant changes to the surrounding area.

1991 Sanborn Map
The Site is labeled Elite Industrial Park, Inc.

Eastern Parcel and Surrounding Properties
Buildings 8, 18, 22 and 24 are the only remaining buildings on the Eastern Parcel. Building 24 is now labeled *vacant and open*. The southern portion of the parcel is labeled *parking and storage*.
An unlabeled structure is present on the western portion of the property containing the filling station, which is located to the south. There are no other significant changes to the surrounding area.

Western Parcel and Surrounding Properties
There are no significant changes to the Western Parcel and surrounding area.

1993 - 1995 Sanborn Maps
There are no significant changes to the Site and surrounding area.

2002 Aerial Photograph

Eastern Parcel and Surrounding Properties
The western and southern portions of the parcel show evidence of miscellaneous storage. The smoke stack and oil tank are still present. There are no other significant changes to the Site or surrounding area.

Western Parcel and Surrounding Properties
There are no significant changes to the Western Parcel.

Two additional oil tanks are present along the west bank of the Passaic River in the same relative area as shown on the 1974 photograph. The large aboveground tank located at the property to the north of the Western Parcel and shown on the 1974 photograph is no longer present.

2.4 Topography, Surface Water and Wetlands

Based on a review of the United States Geological Survey (USGS) Orange topographic quadrangle map, the elevation of the Site is approximately 20 feet above mean sea level. Topography rises to approximately 100 feet to the east of the Site. The ground surface on-site is relatively flat, with a slight slope from east to west towards the Passaic River.

The closest surface water body is the Passaic River, located along the western side of the Site. Storm water runoff from the Eastern Parcel flows west towards Passaic Avenue, where there are storm drains to capture the runoff (Figure 2). On the Western Parcel, storm water runoff both infiltrates into the ground in unpaved areas, and flows overland to the Passaic River.

According to the USDOI National Wetlands Inventory Map and the NJDEP Freshwater Wetlands Map, there are no wetland areas on or adjacent to the Site (see Figure 3).

2.5 Geology

The Western Parcel of the Site is shown on the NJDEP's Historic Fill Database as being in an area where historic fill exists. A copy of the *Historic Fill of the Orange Quadrangle – Historic Fill Map HFM-41* is attached as Appendix B. Historic fill material is defined in the NJDEP's *Technical Requirements for Site Remediation* (N.J.A.C. 7:26E-1.8) as follows:

- *"Historic fill material" means non-indigenous material, deposited to raise the topographic elevation of the site, which was contaminated prior to emplacement, and is in no way connected with the operations at the location of emplacement and which includes, without limitation, construction debris, dredge spoils, incinerator residue, demolition debris, fly ash, or non-hazardous solid waste. Historic fill material does not include any material which is substantially chromate chemical production waste or any other chemical production waste or waste from*

processing of metal or mineral ores, residue, slag or tailings. In addition, historic fill material does not include a municipal solid waste landfill site.

According to the *Technical Requirements for Site Remediation*, the contaminants found in historic fill material include certain polyaromatic hydrocarbons (PAHs) and metals including lead, arsenic, beryllium, cadmium and zinc. A Summary of Target Contaminant Concentrations in Typical Historic Fill Material is provided in Table 4-2 of the *Technical Requirements for Site Remediation* (see Appendix C).

In addition, fill material was observed at the Site from the surface to depths ranging from 2.0 to 5.5 feet below surface during the installation of monitoring wells and the completion of soil borings and test pits. The fill material consisted primarily of gravel and sand with miscellaneous materials including brick and glass fragments, cinders, etc.

Underlying the fill materials at the Site are unconsolidated deposits consisting of a stratified, heterogeneous mixture of well-graded sands and gravels, with lesser amounts of silt and clay that range from 15 to 25 feet in thickness.

Underlying these deposits is a glacial till that consists of an unconsolidated, unstratified mixture of sand, clay and gravel. The thickness of these deposits varies.

Based on the 1996 USGS *Bedrock Geologic Map of North Jersey*, the Site is within the Newark Basin and is underlain by the Passaic formation, which consists of reddish-brown to brownish-purple and grayish-red siltstone and shale with a maximum thickness of approximately 3,600m. The Triassic bedrock originated as sand, silt and mud which eroded from older rocks. The strata have been tilted northwestward with a northeast trend of the beds.

2.6 Hydrogeology

There are currently 21 monitoring wells at the Site that were installed as part of the remedial investigation performed for ISRA compliance. Based on ground water elevation measurements obtained from the wells, the depth to ground water at the Site ranges from approximately 7.5 feet to 10.5 feet below surface. Ground water at the Site is generally found within the overburden sand and clayey sands on the Western Parcel; and gravelly sands with minor amounts of silt and clay on the Eastern Parcel.

The general flow direction of the shallow ground water beneath the Site is to the west, towards the Passaic River. The bedrock water bearing zone in the region is the Triassic Age Passaic Formation, which has a relatively low storage capacity.

2.7 Area of Concern Summary

On behalf of GGD, TRC submitted a *Soil and Ground Water Remedial Investigation Report with Remedial Investigation Workplan* ("RIR/RIW") to the NJDEP on March 9, 2007 for the final phase of the investigation. The NJDEP issued an RIW Approval Letter on April 20, 2009.

Historically, a total of 23 areas of concern (AOCs) have been identified at the Site, which has been divided into two areas: Site-Wide AOC I (SWAOC-I), which is the Eastern Parcel; and Site-Wide AOC II (SWAOC-II), which is the Western Parcel. The AOCs are shown on Figure

2.

2.7.1 Western Parcel – SWAOC-II

Of the 23 AOCs identified at the Site, only three were located on the Western Parcel:

- AOC 19: Drum Storage Area (Building 23);
- AOCs 21a and 21b: Marshall Clark Building Drain and Loading Dock; and
- AOC 22: Wall Behind Building 23.

The NJDEP has approved No Further Action (NFA) for 19 of the 23 AOCs, including AOCs 21a and AOC 22 on the Western Parcel.

Due to the presence of historic fill material throughout the Western Parcel, the NJDEP approved the use of engineering and institutional controls (i.e., capping system and Deed Notice), as the remedial measures to address SWAOC-II, including AOCs 19 and 21b. The contaminants of concern on the Western Parcel are polyaromatic hydrocarbons (PAHs), which are attributable to the presence of the fill material. There are no known discharges on the Western Parcel, only the presence of historic fill material which was used to raise the grade of this area for construction purposes. No further soil sampling is required on the Western Parcel; only the establishment of the engineering and institutional controls due to the historic fill material (also encompasses AOCs 19 and 21b).

2.7.2 Eastern Parcel – SWAOC-I

Soil

The contaminants of concern on the Eastern Parcel include arsenic, lead, PAHs, volatile organic compounds (VOCs), and minor detections of polychlorinated biphenyls (PCBs). Most of the soil contamination has been delineated; however some additional soil sampling on the Eastern Parcel will be conducted during the implementation of the remedial investigation workplan that was recently approved by the NJDEP. However, no soil contamination has been found to cross Passaic Avenue from the Eastern Parcel onto the Western Parcel.

Ground Water

Ground water investigations conducted at the Site have detected concentrations of VOCs above the NJDEP's Ground Water Quality Standards, specifically tetrachloroethene (PCE) and its degradation products. For the most part, VOCs have been found primarily on the Eastern Parcel. Ground water flow direction at the Site is to the west, towards the Passaic River. Although low levels of chlorinated VOC breakdown products have been detected in wells on the Western Parcel, no VOC exceedances have been detected in the westernmost wells along the Passaic River. Therefore, the VOCs detected in ground water at the Site have not been found to impact the Passaic River.

An area of floating product has been observed on the northeastern portion of the Eastern Parcel. The light non-aqueous phase liquid ("LNAPL") has been detected off-site on Clark Avenue to the east of the Eastern Parcel and in wells located in the middle of the Eastern Parcel. LNAPL has not been detected in the westernmost wells along Passaic Avenue. As a result, the LNAPL has not migrated beyond the Eastern Parcel either to the Western Parcel or the Passaic River.

3.0 FEDERAL NATURAL RESOURCE DAMAGE LIABILITY – PASSAIC RIVER

The primary federal regulatory program that governs NRD is the Comprehensive Environmental Response and Compensation Liability Act ("CERCLA"), 42 U.S.C. 9607(a)(4)(C) and Title 43 of the Code of Federal Regulation, Part 11 Subpart E. The following analysis prepared by TRC assesses NRD liability for the Site. TRC's approach to calculating NRDs is consistent with that presented in CRA's 2007 Expert Report. However, TRC modified some of CRA's assumptions including:

- River restoration approach. The CRA 2007 Expert Report assumed the River will be restored via natural attenuation. However, the NRD assessment presented herein assumed river restoration will be achieved by active remediation of river sediments, which are allocated to the Site.
- Contributing site area. The CRA 2007 Expert Report assumed surface sediment (historic fill) erosion from the entire site, whereas the NRD assessment in this report accounted for sediment erosion from undeveloped portions of the Site only. TRC specifically calculated an average of the areas historically subject to erosion on the Site.
- Compensatory habitat unit cost. The CRA 2007 Expert Report assumed a unit price of $150,000/acre for restored wetlands compared to $300,000 for average unit wetlands credit in this report.
- The productive life and duration for the compensatory project to achieve and maintain the required service levels.
- Baseline year for NRD calculations. The baseline year in the CRA 2007 Expert Report is 2007, whereas the baseline year for this report is 2009.

3.1 Potential Migration Pathways

CRA identified the following four potential pathways for the migration of the primary contaminants of concern from the Site to the Passaic River:

- Direct discharges to the Passaic River;
- Indirect discharges through the sewer system;
- Runoff and overland flow directly to the River; and
- Groundwater discharge to the Passaic River.

Available information indicates that there were no direct discharges from the Site to the Passaic River. The only migration pathways are contaminated groundwater and storm water runoff. As the floating product and dissolved TCE plumes are localized with limited extent on the Eastern Parcel and have not been detected near the river, these plumes will not likely have an impact on the Passaic River. Consequently, liability from floating product and TCE in groundwater discharging to the Passaic River was assumed to be zero.

Based on soil sampling conducted at the Site, there are elevated concentrations of PAHs and some metals, notably lead, and low, but localized concentrations of PCBs (from a transformer pad) found in surface soils. These three constituents are the primary contaminants of concern in

the Passaic River (Malcolm Pirnie, 2007b). In general, these compounds are too insoluble and tightly bound to soil particles to move readily via groundwater. Moreover, primary sources of most of the PAHs and metals in surface soils is likely to be historic fill; thus, soil contaminants will likely have been significantly weathered and less likely to dissolve in groundwater. The PAHs are likely to be especially immobile because the primary source of the PAHs is the coal cinders present in the historic fill material. PAHs in coal cinders are much less mobile and 5 to 10 times less bioavailable than PAHs associated with releases to surface soils (Reible and Fleeger, 2004). This general assessment is corroborated by the groundwater analytical results for PAHs.

The above reasoning along with an analysis of the groundwater quality data indicate that the primary transport mechanism for PAHs and lead to the Passaic River was attributed to erosion and transport of surficial contaminated sediments from the Site during storm events.

The NRD calculations were based on PAH and lead impacts. Other metals, TCE and PCBs were assumed to have no impact due to their limited and localized extent or due to remediation (the limited area of PCB impacted soil was excavated and removed from the Site), and thus were not considered in the analysis.

3.2 Approach

3.2.1 Sediment Loading

Sediment and pollutant loads from areas with predominantly unpaved (pervious) surfaces are typically estimated with the Universal Soil Loss Equation [USLE] (Heathcote 1998; Yang, 1996; Goldman *et al*. 1986). The USLE is used in this NRD evaluation to predict the long-term average soil losses in runoff and contaminant loading from pervious areas of the Site to the River. The USLE is described below:

$$A = R * K * LS * C * P$$

Where, A = soil loss per unit area normally in tons per acre
R = rainfall erosivity factor
K = soil erodibility factor, tons/acre
LS = slope length – steepness factor
C = cropping management factor
P = conservation practice factor

The rainfall factor R represents average long-term, rainfall intensity. Based on estimates of the annual rainfall erosion index "R" in the United States (Goldman et al., 1986; Wischmeier and Smith, 1978), a value of 175 was estimated for the site.

The soil-erodibility factor K describes the inherent erodibility of the soil expressed in the same units as the annual erosion losses in tons per acre. The value of K can be obtained from the nomograph (Goldman et al., 1986) developed by Wischmeier and Smith (1978) given the percentage of sand, the percentage of silt and fine sand, the percentage of organic matter, the soil texture, and the soil permeability. The soil found at the Site is Udorthents (USDA, 2007) with a K value of 0.43.

The slope-steepness factor LS can be estimated (Goldman et al., 1986; Wischmeier and Smith, 1978) based on the ground slope. Based on ground surface elevations, a conservative average slope for ground surface at the Site is estimated to be approximately 1.8%. The average slope and the average slope length (estimated at 200 feet) results in an LS value of 0.25.

The cropping-management factor C is estimated based on ground cover conditions (Goldman *et al.*, 1986; Wischmeier and Smith, 1978). A C value of 0.02 was assigned to the Site, which corresponds to no canopy cover with more than 75% grass surface cover.

A value of 1 was used for the conservation practice factor P, because the site is on urban land and there are no erosion control practices for unpaved areas (Goldman *et al.*, 1986).

Accordingly, the unit soil loss (sediment erosion and transport) from the Site was estimated to be approximately 0.38 tons/acres/year (0.09 kg/m^2/year).

The total Site area is approximately 7 acres. However, the NRD calculations account for sediment loss and contribution to the River from undeveloped portions of the two parcels at an average area of approximately 3 acres. For sediment transport from the undeveloped portions of both parcels, the annual soil loss was estimated to be approximately 1,000 kg/year.

3.2.2 NRD Apportionment Basis

TRC considered two approaches for apportionment of the injury in the River to the site (proportion of contaminated sediment contribution from the Site to the total contaminated sediment loading in the Passaic River) including:

1. Contaminant concentration basis (*i.e.*, ratio of contaminant concentrations in sediments emanating from the Site to contaminant concentrations in River sediments).
2. Sediment area basis (*i.e.*, proportion of the Site sediment loading to the total Passaic River sediment amount).

The average PAH concentration in surface soil using surface samples was estimated to be approximately 43 mg/kg (CRA 2007). The resulting total PAH loading from the erosion of surface soils at the Site was estimated to be 0.043 kg/yr (the product of an average soil loss of 1,000 kg/yr and an average PAH concentration of 43 mg/kg). The average lead concentration was estimated as 226 mg/kg and lead loading from the Site was calculated to be approximately 0.23 kg/yr.

The CRA 2007 report indicates that calculating NRD liability by assessing the Site's contribution to sediment contamination based on the concentration basis would yield very minimal values. The report indicates that the Passaic River receives about 79,000 cubic yards of sediments per year (Malcolm Pirnie, 2007b), which represents a total amount of 43,000 metric tons. PAHs and lead loadings from the Site into the total River sediment were calculated to be approximately 0.001 mg/kg and 0.005 mg/kg, respectively (calculated by dividing total PAH and lead loading from erosion of the Site surface soil over total sediment mass received in the Passaic River). Comparing these contaminant loadings to the total average PAH and lead concentrations in the Passaic River of 20 mg/kg and 300 mg/kg (Malcolm Pirnie, 2007b),

indicates that the Site was estimated to contribute about 1/20,000th of the average PAH concentration and about 1/60,000th of the average lead concentration in the Passaic River sediments.

The above assessment indicates that contribution from the Site based on the first method (*i.e.*, contaminant concentration basis) clearly had no meaningful impact on the concentrations of either PAHs or lead in the Passaic River sediments. Thus, the first method was not considered further, and the remaining method (loading area basis) was used for River injury apportionment to the Site and calculating the corresponding NRD (Section 3.3).

3.2.3 Habitat Equivalence Analysis (HEA)

The NRD liability was estimated using the Habitat Equivalence Analysis (HEA) method. The HEA process is outlined in the natural resource damage assessment (NRDA) regulations implementing OPA (15 CFR Part 900) and in the proposed statutory changes to the 1981 CERCLA NRDA provisions (43 CFR Part 11). HEA is an example of the service-to-service approach to scaling. The implicit assumption of HEA is that the public is willing to accept a one-to-one trade-off between a unit of lost habitat services and a unit of restoration project services (*i.e.,* the public equally values a unit of services at the injury site and the restoration site). HEA does not necessarily assume a one-to-one trade-off in resources, but instead in the services they provide. HEA is applicable so long as the services provided are comparable. The assumption of comparable services between the lost and restored habitats may be met when, in the judgment of the trustees, the proposed restoration action provides services of the same type and quality, and of comparable value as those lost due to injury.

In this report, one-to-one trade-off between the resource services at the compensatory restoration site and the injury site is assumed. Therefore, the scaling analysis simplifies determining the scale of a restoration action that provides a quantity of discounted replacement services equal to the quality of discounted services lost due to the injury. If the services at the compensatory restoration site were not of the same type and quality or of comparable value to those injured, then the assumption of a one-to-one trade-off between the resources at the injury site and the compensatory restoration site may be inappropriate. In these cases, NOAA recommends that trustees evaluate whether the condition for HEA are met and consider using the valuation approach as an alternative to determining the trade-off between injuries and compensatory restoration actions.

The compensatory restoration project assumes restoring, or purchasing from available wetlands banks, an equivalent area of tidally flowed wetlands, which are more ecologically and economically valuable than the Passaic River sediments. New Jersey has approved approximately 10 wetland mitigation banks in the recent past. A mitigation bank is where wetlands, uplands and/or other aquatic resources are restored, created, enhanced, or preserved by a mitigation bank operator for the purpose of providing compensatory mitigation for disturbance to freshwater wetlands and/or State open waters. The Wetland Mitigation Council must give approval for a mitigation bank. Presently, only a few banks are actively selling wetlands credits in New Jersey. It is expected that wetland bank credits will be available for purchase in the next few years.

Hence, it can be assumed that one acre of tidally flowed wetlands is equivalent to one acre of Passaic River sediment. Based on recently reported wetlands bank rates in New Jersey, the cost of one acre of wetlands ranges between approximately $200,000 and $400,000. For this analysis, an average value of $300,000 was used for valuating the compensatory habitat.

The HEA approach requires calculating discounted (net present value) losses and gains to normalize past and future benefits or costs and to make them comparable to present benefits and costs. The discount rate incorporates the standard economic assumption that people place a greater value on having resources available in the present than on having their availability delayed until the future. The annual discount rate used in HEA calculations represents the public's preference toward having a restoration project in the present year, rather than waiting until next year. For discounting interim service losses and restoration gains when scaling compensatory restoration, the regulations recommend using the consumer rate of time preference as the rate of discount. NOAA recommends using three percent (3%) as a reasonable proxy of the consumer rate of time preference (NOAA, 1999).

The HEA calculations were based on the following assumptions:

- The injury to the River would cease by end of year 2012 (assumed to be the year when the Site would be remediated and surface sediments runoff to the River discontinues).
- River restoration (active remediation) was assumed to begin by end of 2012 and achieve full recovery to baseline conditions by 2018 (within approximately 5 years).
- The initial year for NRD liability/injury is 1981, pursuant to CERCLA.
- The baseline year for NRD calculations is 2009, after which services were assumed to increase along a linear path until full recovery or until the replacement (restoration) project services reach maturity levels.
- The compensatory habitat project was assumed to begin by 2010 (*e.g.*, purchase of wetlands credits following NRD settlement) and achieve the required service level by year 2011. For practical purposes, a 30-year life cycle is assumed for the compensatory project as recommended by the USEPA guidance document (USEPA 2000). Thus, the year 2040 was assigned as the last productive year at the required service level or greater for the compensatory/replacement habitat (after which benefits provided by the compensatory project were assumed to decline below the required service levels). The increase in services of the compensatory habitat is calculated per acre of replacement project. The size (area) of the replacement project to compensate for lost services due to injury is calculated by dividing the sum of discounted service-acre-years lost over the sum of discounted service gain per acre from the restoration project.

3.2.4 Limitations

The NRD calculations have the following inherently conservative assumptions:

- Sediment and contaminant loadings are attributed to the undeveloped portions of both parcels. This assumption disregards the likelihood that (1) sediments from the Eastern Parcel are most likely captured in stormwater catch basins along Passaic Avenue; and (2) once entering the sewer system, contaminants would have been removed at the Publicly Owned Treatment Works (POTW) prior to discharge to the River. Thus, the actual

amount of sediments that emanated from the Site and reached the river were likely to have been less than that considered in the NRD calculations below.

- The NRD estimates did not consider the background degradation of the River water and sediment quality and the associated impaired baseline value of the Passaic River. The analysis was based on Co-Occurrence Sediment Quality Benchmarks (CoSQB), which are usually used by the Trustee for assessing injury to natural resources. This approach would overestimate the likely injury.
- All PAH and metal loading to the Passaic River was assumed to be captured in sediments, as opposed to being flushed out of the River system, which overestimates the contaminant loading in the River.

3.3 NRD Calculations with Active River Remediation

River restoration entails active remediation to remove River sediments that potentially emanated from the Site. Thus, the NRD compensation equals the cost of River remediation plus compensation for service loss due to injuries until the River is recovered to baseline conditions (injury period from years 1981 to end of 2012).

At this stage, the scope of the proposed restoration and compensatory projects are conceptual, and cost estimates are screening level. Thus, as recommended by the USEPA guidance document (USEPA 2000), a contingency has been incorporated into the calculations to account for uncertainty in the project scope and cost. Consistent with the draft USEPA Focused Feasibility Study for Source Control Early Action at the Lower Passaic River (Malcolm Pirnie 2007a), a 20% contingency is used in these NRD calculations.

3.3.1 River Sediment Remediation Cost

The remediation approach assumes that an equivalent amount of river sediment to that of contaminated sediment deposited from the Site during the impact duration would be dredged, stabilized and disposed off-site. The selected approach is consistent with the remedial strategies considered in the USEPA draft Focused Feasibility Study for the Source Control Early Action for the Lower Passaic River (Malcolm Pirnie 2007). The proposed removal of the contaminated sediments would serve as complete and comprehensive remedy for all Site related Passaic River impacts whether implemented as an Interim or Final Remedy.

For purposes of this analysis, it is assumed that historic fill was placed on-site and corresponding erosion of historic fill (impacted surface soil) to the River began as early as 1900. It is assumed that active River remediation would commence by 2012 (which corresponds to the time when sediment transport to the River would cease following Site remediation) and that the River would recover to baseline conditions within approximately 5-6 years following active remediation (by year 2018).

The total amount of sediment deposition to the River was estimated to be approximately 447 kg/year (based on the USLE). Thus, the total volume of sediments deposited to the River during the 113 years was estimated to be approximately 90 cubic yards. As summarized in Table I below, the total cost to remediate river sediment that potentially emanated from the site was estimated with a 20% contingency to be approximately $185,000. Details of the cost estimate are presented in Appendix D-1.

Table I –River Sediment Remediation Cost Projection

Task	Cost
Pre-Design Studies	$30,000
Sediment Excavation, Stabilization & Disposal	$36,000
Survey & Laboratory Analysis	$15,000
Subtotal – Construction Cost	$81,000
Contingency (20% of construction cost)	$17,000
Engineering (permits, design, project/construction management, reporting)	$70,000
Regulatory Oversight (10% of construction & engineering with contingency)	$17,000
PROJECT TOTAL	**$185,000**

3.3.2 NRD Calculations Using Sediment Loading Area Basis

The total area of the lower Passaic River was estimated at about 500 acres. Since the Site was estimated to supply 1,000 kg/yr of sediments, it would supply approximately 1/45,000th of the total sediment load (43,000 metric tons/year) to the Passaic River. The Site would supply 0.012 acres of Passaic River sediments (calculated by multiplying total area of lower Passaic River by Site sediment load proportion to Passaic River sediment loading of 1/45,000) under the assumption that sediments eroded from the Site were isolated from other Passaic River sediments.

Considering the sediment quality benchmarks (SQBs) traditionally used by Trustees, it is possible that the Trustees would assert that these concentrations, especially the total PAHs, would cause impacts to aquatic benthos. Both PAHs and metals were assumed to cause 100% loss of service to the affected area and that the baseline value of the Passaic River was 75%. However, after the Site is remediated, the amount and concentrations of surface soils would be reduced to even more negligible levels. Releases were assumed to end in 2012, after which injuries in the Passaic River were assumed to decline and service levels fully recover to baseline conditions by 2018.

Based on the above assumptions, the total discounted service-acre-years lost due to PAHs and lead impacts were estimated to be approximately 0.4 acre-years. Using the HEA approach, these damages can be offset by the creation (or purchase of wetlands credits) of approximately 0.02 acres of wetlands (Appendix D-2). Based on this equivalent replacement area and an average cost for wetlands credits of $300,000 per acre, the cost of the compensation project with a 20% contingency was estimated to be approximately $8,000.

Accordingly, the total NRD liability (river restoration and compensatory project) with a 20% contingency was estimated at approximately *$193,000*[1]. Table II below summarizes the NRD compensation and restoration estimates for the Passaic River and Ground Water.

Table II – NRD Liabilities Allocated to the Site

Liability		Cost
Federal - Passaic River NRD	Compensatory Project	$8,000
	Remediation	$185,000
	Sub-Total	***$193,000***
NJDEP – Groundwater NRD		***$45,000***

[1] Of this amount, the debtor's (i.e., KIA's) liability for its ownership and for AMMCO's operations was determined based upon the number of years after 1959 during which historic fill would be subject to stormwater runoff (i.e., from 1959 – 2013, the year when remediation of the Property is expected to be completed). This corresponds to an allocation ratio of 48%, or $92,200. The remaining 52% or $100,800 represents an "orphan share" for the period between 1900 and 1959.

4.0 NJDEP NATURAL RESOURCE DAMAGE LIABILITY – GROUND WATER

The NJDEP Natural Resource Restoration (NRR) provides a formula to derive an NRD estimate for injuries to ground water resources. The formula considers such factors as the size of the plume of ground water contamination, the volume of impacted ground water and the cost of drinking water in the Site region. The resulting NRD amount will provide the scope of a restoration project. The NJDEP ground water NRD formula is described as follows:

NRD Amount = Plume Area × Annual Aquifer Recharge × Water Rate × Plume Duration

The parameters used in the formula for calculating the ground water NRD for the Site are described below (Table III):

Table III - NJDEP Ground Water NRD Calculations

NJDEP NRD Formula Parameters		**Site Data**
Planning Area & Projected Status	The Planning Area and projected status is determined from the New Jersey Statewide Water Supply Plan 1996	Kearny – 5 (surplus) (DEP designation)
Annual Ground Water Recharge	This is the value in feet (ft.) for the Planning Area and is determined from *New Jersey Statewide Water Supply Plan, 1996*	1.25 feet/year
Water Rate	This is the current value in $/1,000 gallons for the Planning Area derived from NJ Board of Public Utilities Data	$0.91/1,000 gallons
Aerial Extent of Contaminant Plume	The aerial extent in square feet of a contaminant plume determined in a remedial investigation pursuant to the *Technical Requirements for Site Remediation N.J.A.C 7:26E* (the entire plume regardless of being "on or off-site").	175,000 ft^2 (500 ft x 350 ft) based on November 2005 data
Volume of Ground Water	Plume Area x Annual Aquifer Recharge Rate (ft^3/year)	218,750 ft^3/year (1,636,250 gallons/year)
Plume Duration	The time (years) prospective from when the remedial decision is made until the NJ Ground Water Quality Standards have been met or 30 year maximum, whichever comes first	30 years (maximum)
Conversion Constants	(7.48 gallons / $feet^3$) and (1 acre = 43,560 $feet^2$)	
NJDEP Ground Water NRD (rounded)		**$45,000**

NRD Amount = 175,000 ft^2 x 1.25 ft/yr x $0.91 x 30 yrs. x 7.48 gal./1,000 ft^3 = $44,670 (rounded to $45,000)

Thus, the maximum ground water NRD that was calculated by using the NJDEP formula is approximately $45,000.

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FIGURES

ORANGE, N.J. QUADRANGLE
1955
PHOTOREVISED 1981
7.5 MINUTE SERIES (Topographic)

0 2000 FT.
APPROXIMATE SCALE

N

NEW JERSEY
QUADRANGLE LOCATION

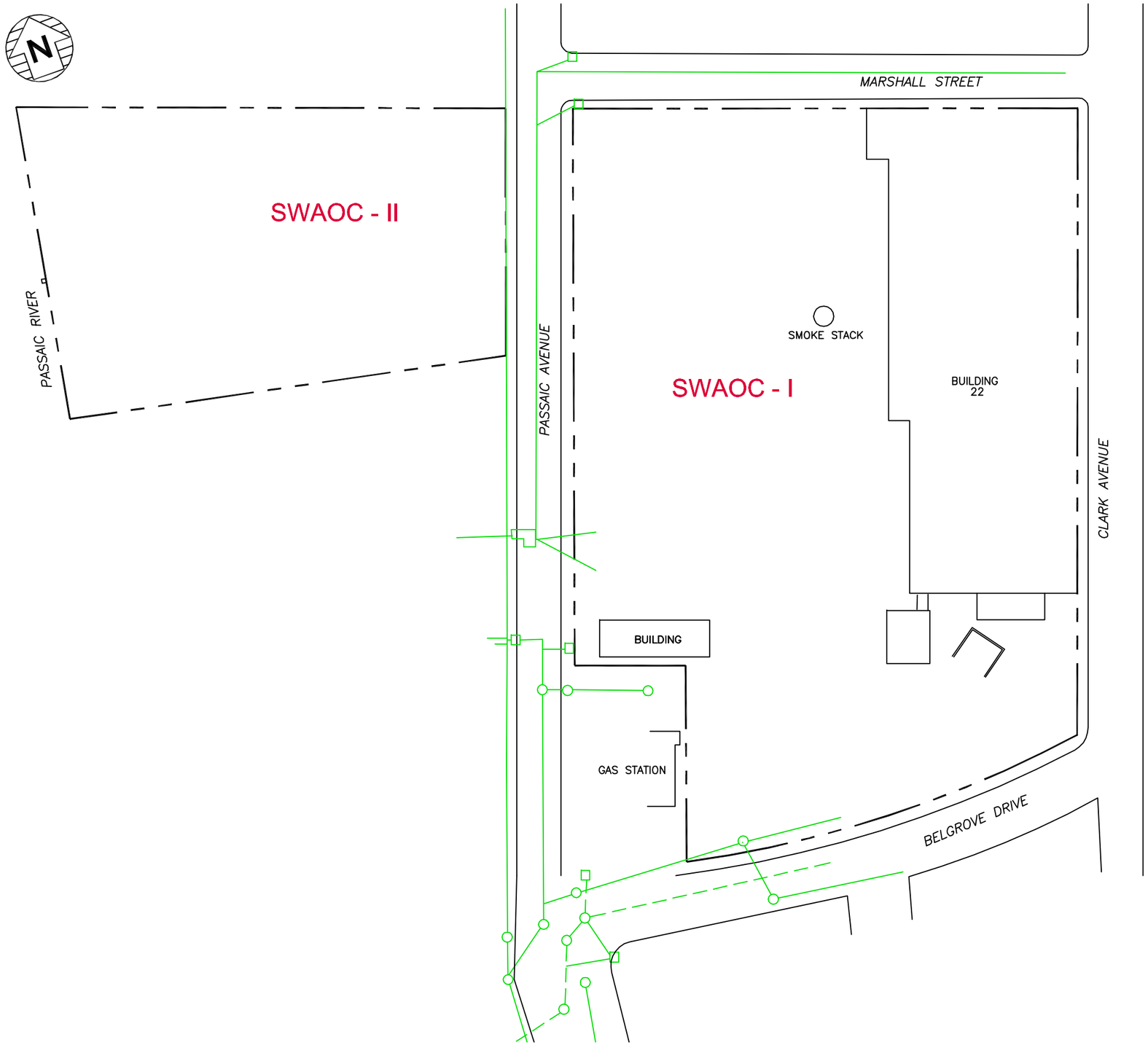
TRC ENVIRONMENTAL CORP.
57 East Willow Street
Millburn, New Jersey 07041

SITE LOCATION

AMERICAN MODERN METALS CO. – KEARNY, NEW JERSEY

PREPARED BY: EB/ODL	DATE: FEBRUARY 2007
JOB NO.: 02C1894	FIGURE: 1

1894SLM –03/01/07



EXPLANATION

- PROPERTY BOUNDARY
- COMBINED SANITARY AND STORM SEWER
- MORE RECENT STORM SEWER
- MANHOLE
- CATCH BASIN

Areas of Concern (AOC)

SWAOC-I = Site-Wide AOC I (Block 14, Lots 3 and 4)
SWAOC-II = Site-Wide AOC II (Block 1, Lots 9, 10, and 11)

0 100 FT.
APPROXIMATE SCALE

TRC ENVIRONMENTAL CORP.
57 East Willow Street
Millburn, New Jersey 07041

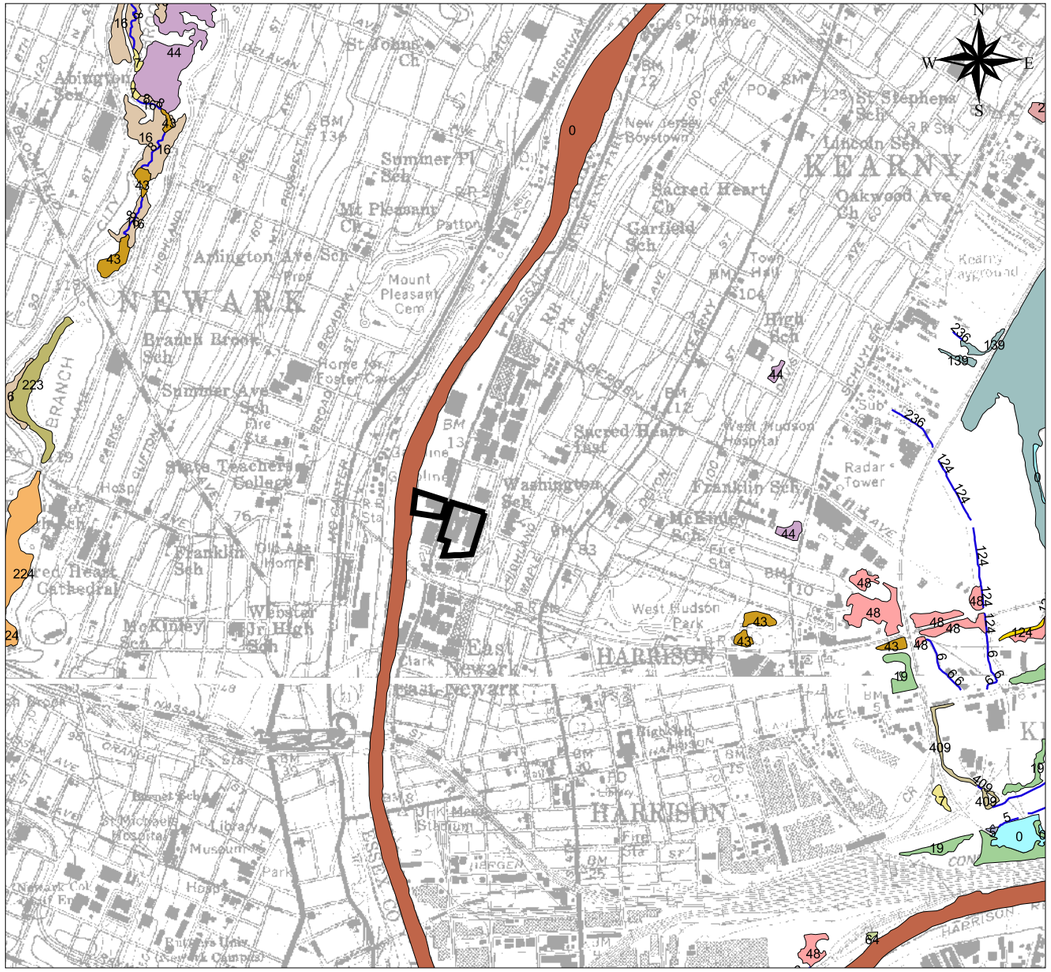
SITE PLAN WITH AREAS OF CONCERN

AMERICAN MODERN METALS CO. – KEARNY, NEW JERSEY

JOB NO. 1894–154733

DMP/LB	DATE: JUNE 2009	FIGURE: 2

FILE: M:\CAD FILES\WORK\1894\1894–11.DWG, DATE: 07/22/2009 12:49:35PM



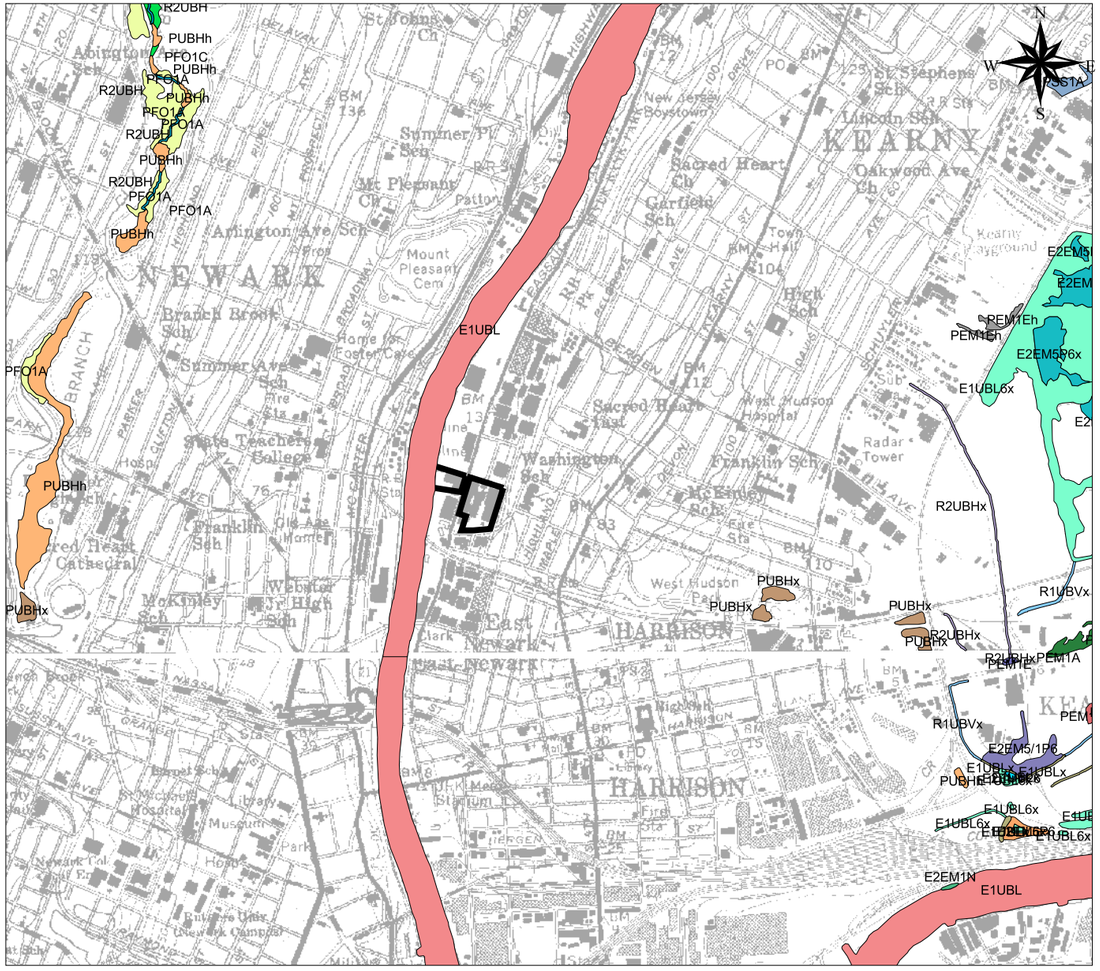
NJDEP FRESH WATER WETLANDS MAP

- 0: - SALINE MARSHES
- 0: - TIDAL WATERS
- 5: PEM1C - HERBACEOUS WETLANDS
- 7: POWH - NATURAL LAKES
- 16: PFO1B - DECIDUOUS WOODED WETLANDS
- 19: PEM1B - HERBACEOUS WETLANDS
- 20: PSS1B - DECIDUOUS SCRUB/SHRUB WETLANDS
- 43: POWHx - ARTIFICIAL LAKES
- 44: MODL - MANAGED WETLANDS (MODIFIED)
- 48: MODD - DISTURBED WETLANDS (MODIFIED)
- 64: PEM1E - HERBACEOUS WETLANDS
- 124: R2OWx - STREAMS AND CANALS
- 139: PEM1Eh - HERBACEOUS WETLANDS
- 223: L2OWHh - ARTIFICIAL LAKES
- 224: L2OWHx - ARTIFICIAL LAKES
- 409: R3UB3x - STREAMS AND CANALS

- 124: R2OWx - STREAMS AND CANALS
- 236: R3OWx - STREAMS AND CANALS
- 392: R3UB1x - STREAMS AND CANALS
- 409: R3UB3x - STREAMS AND CANALS
- 5: PEM1C - HERBACEOUS WETLANDS
- 6: R2OW - STREAMS AND CANALS
- 8: R2UB2 - STREAMS AND CANALS

SOURCES:
1. Orange and Elizabeth Quadrangles, N.J., Digital Geodata Series, New Jersey Geological Survey, NJDEP.
2. NJDEP Digital Linear and Polygon Wetlands GIS Database.

0 2000 Feet



NATIONAL WETLANDS MAP

- E1UBL - Estuarine and Marine Deepwater
- E1UBL6x - Estuarine and Marine Deepwater
- E1UBLx - Estuarine and Marine Deepwater
- E2EM1N - Estuarine and Marine Wetland
- E2EM1P6 - Estuarine and Marine Wetland
- E2EM5/1P6 - Estuarine and Marine Wetland
- E2EM5P6 - Estuarine and Marine Wetland
- E2EM5P6x - Estuarine and Marine Wetland
- PEM1/5Rx - Freshwater Emergent Wetland
- PEM1A - Freshwater Emergent Wetland
- PEM1C - Freshwater Emergent Wetland
- PEM1E - Freshwater Emergent Wetland
- PEM1Eh - Freshwater Emergent Wetland
- PFO1A - Freshwater Forested/Shrub Wetland
- PFO1C - Freshwater Forested/Shrub Wetland
- PSS1A - Freshwater Forested/Shrub Wetland
- PSS1C - Freshwater Forested/Shrub Wetland
- PUBFh - Freshwater Pond
- PUBHh - Freshwater Pond
- PUBHx - Freshwater Pond
- R1UBVx - Riverine
- R2UBH - Riverine
- R2UBHx - Riverine

SOURCES:
1. Orange and Elizabeth Quadrangles, N.J., Digital Geodata Series, New Jersey Geological Survey, NJDEP.
2. National Wetlands Inventory Polygon Data, Orange and Elizabeth Quadrangles, U. S. Fish and Wildlife Service.

TRC ENVIRONMENTAL CORP.
57 East Willow Street
Millburn, New Jersey 07041

NJDEP AND NATIONAL FRESH WATER WETLANDS MAPS

AMERICAN MODERN METALS CO. - KEARNY, NJ

PREPARED BY: BH/LB	DATE: JULY 2009
JOB NO.: 99C1894	FIGURE: 3

1894GIS3.APR

APPENDIX A

Sanborn Fire Insurance Maps

"Linking Technology with Tradition"®

Sanborn® Map Report

Ship To: Tricia Ward
TRC Raviv
57 E. Willow Street
Millburn, NJ 07041

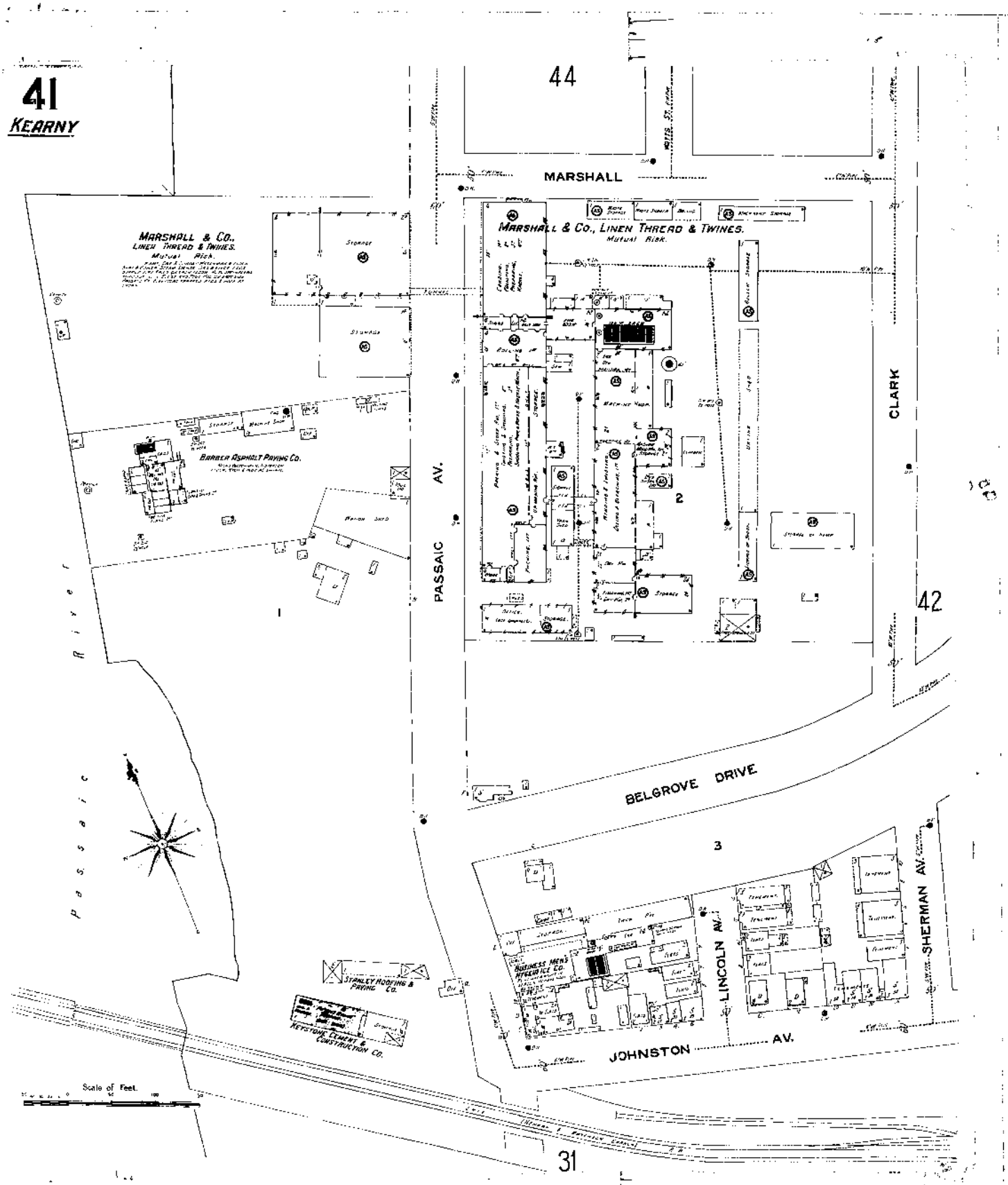
Order Date: 5/9/2005 **Completion Date:** 5/11/2005
Inquiry #: 1417539.2S
P.O. #: NA
Site Name: American Modern Metals
Address: 65 Passaic Avenue
City/State: Kearny, NJ 07032
Cross Streets:

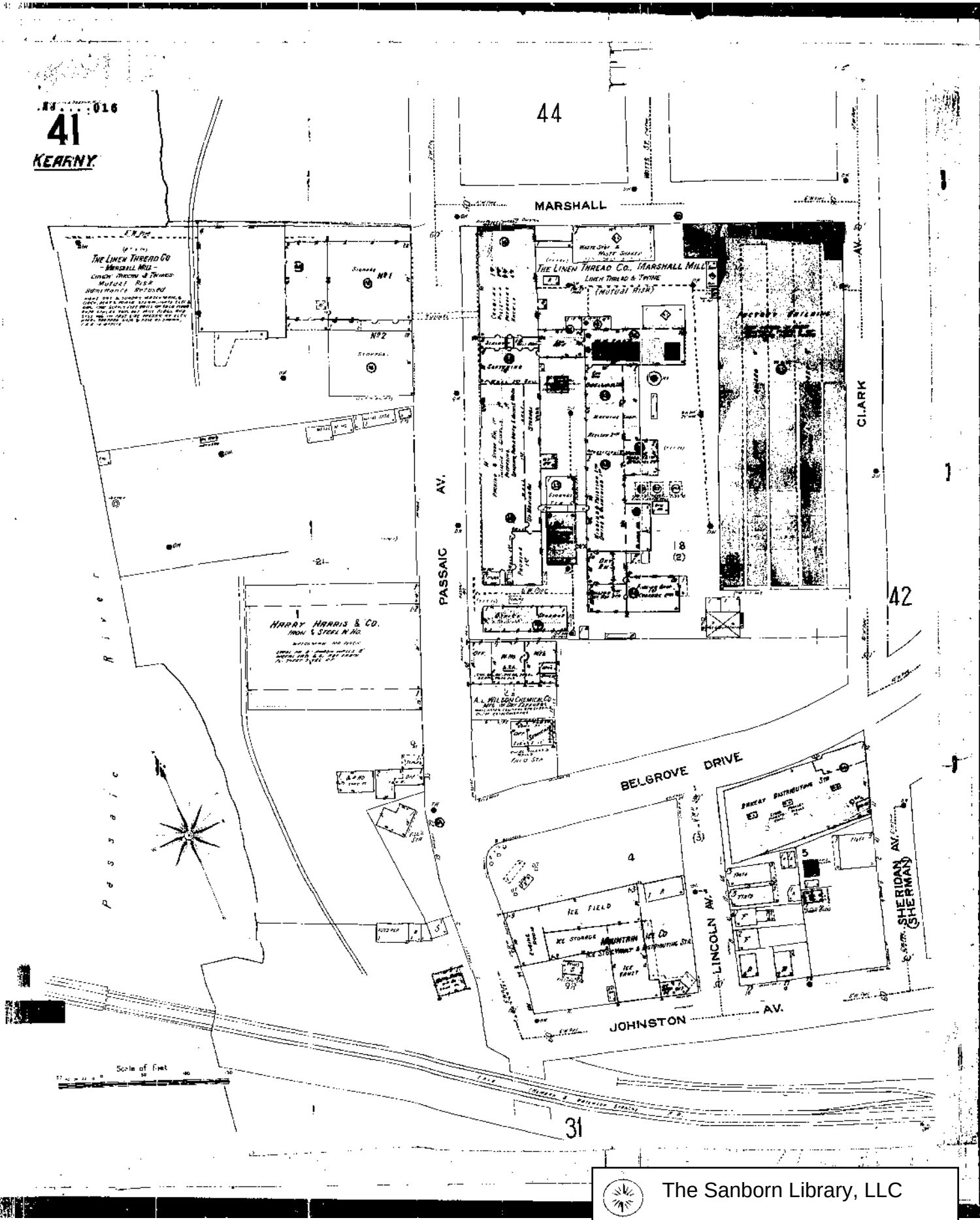
Customer Project: 1894-A
1018107ERK 973-564-6006

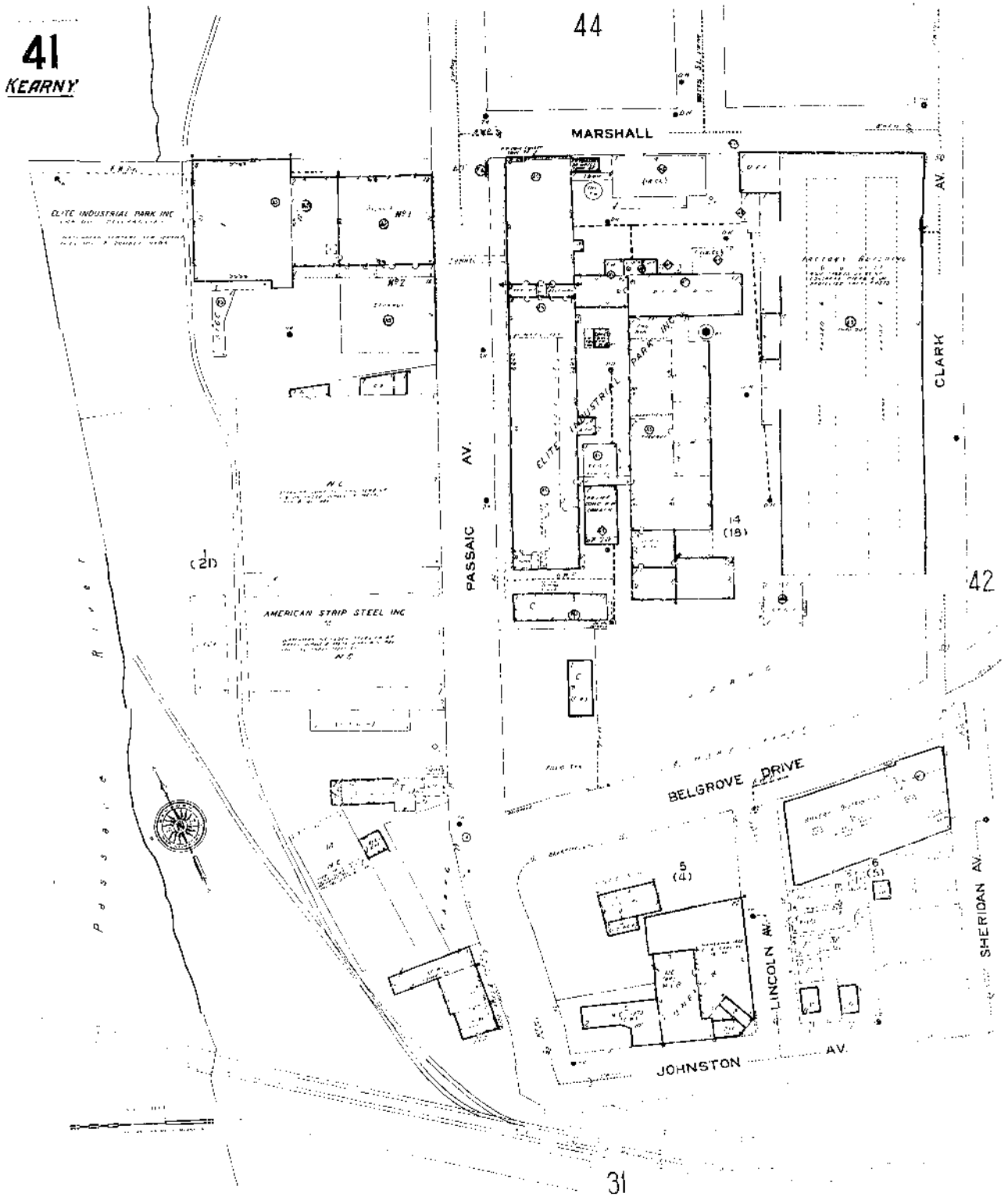
Based on client-supplied information, fire insurance maps for the following years were identified

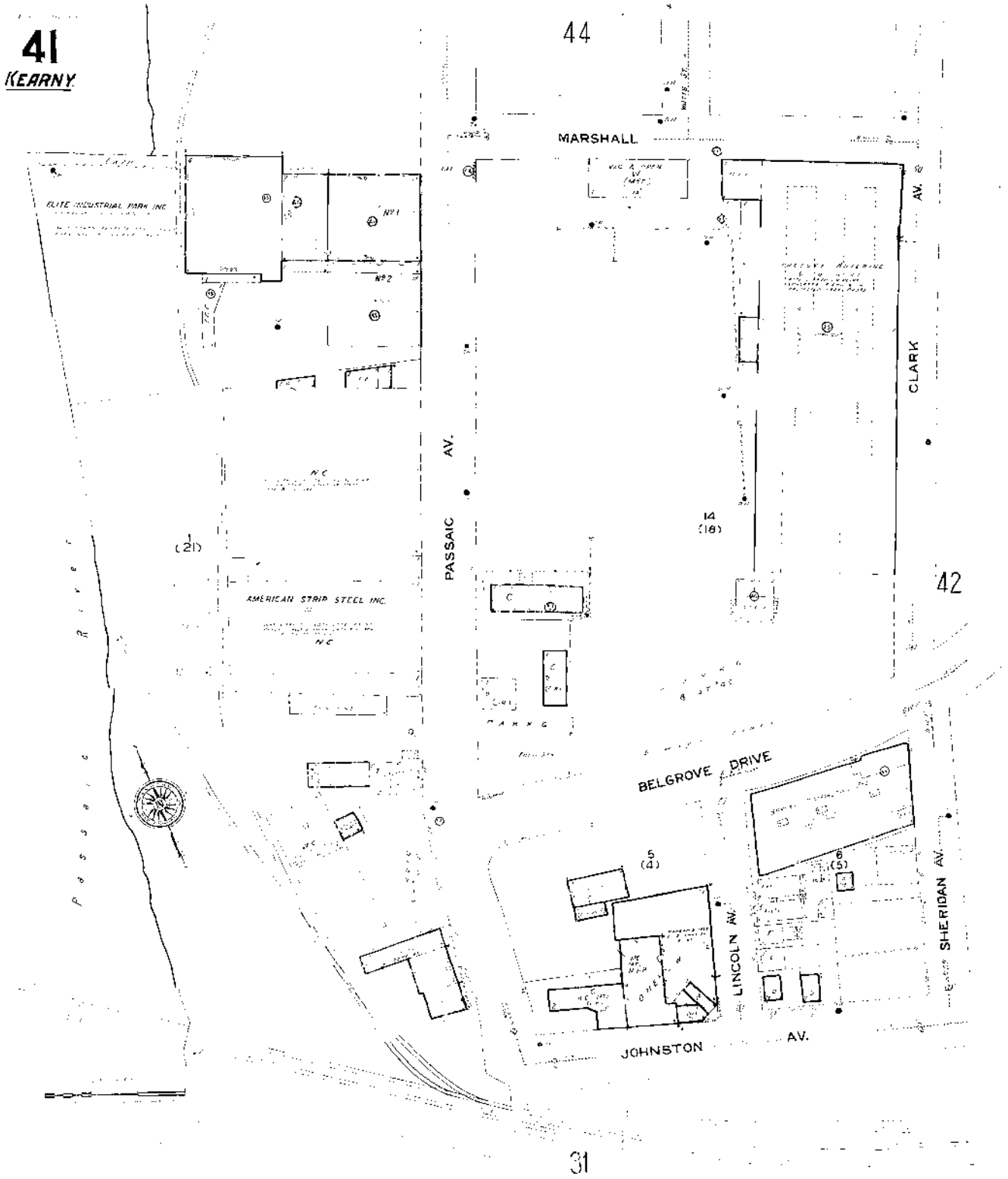
1907 - 1 Map
1950 - 1 Map
1985 - 1 Map
1991 - 1 Map
1993 - 1 Map
1994 - 1 Map
1995 - 1 Map

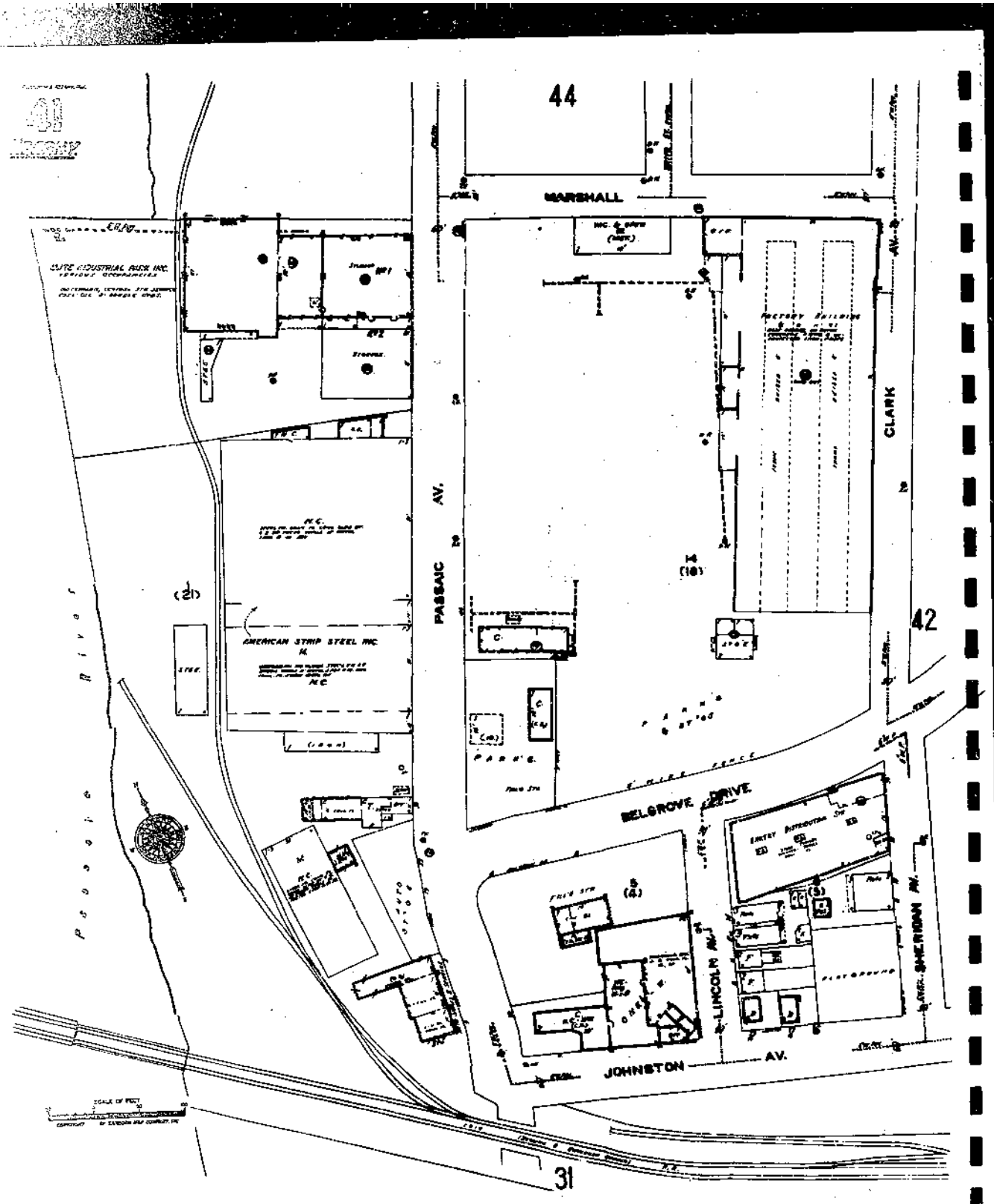
Limited Permission to Photocopy Total Maps: 7

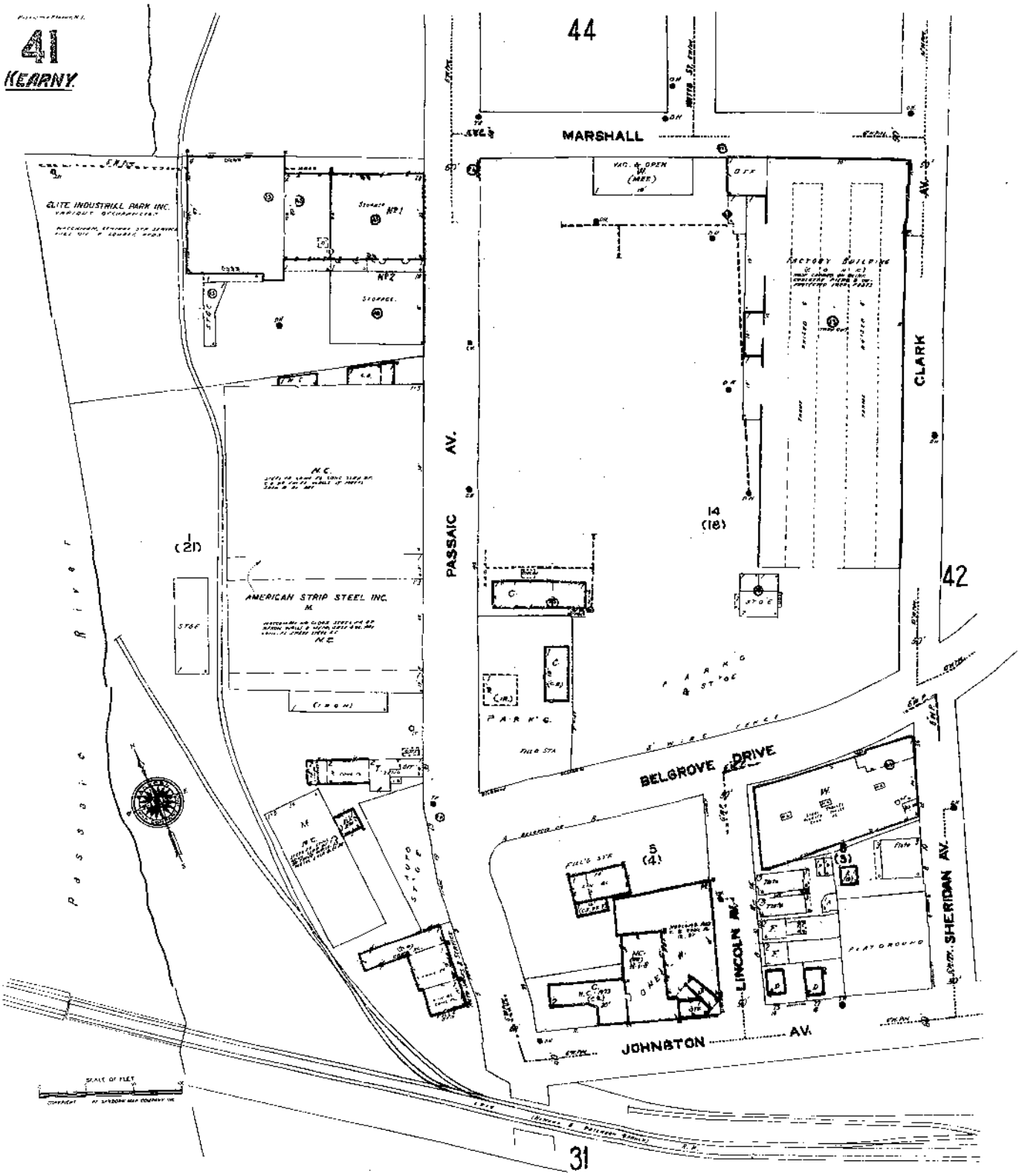


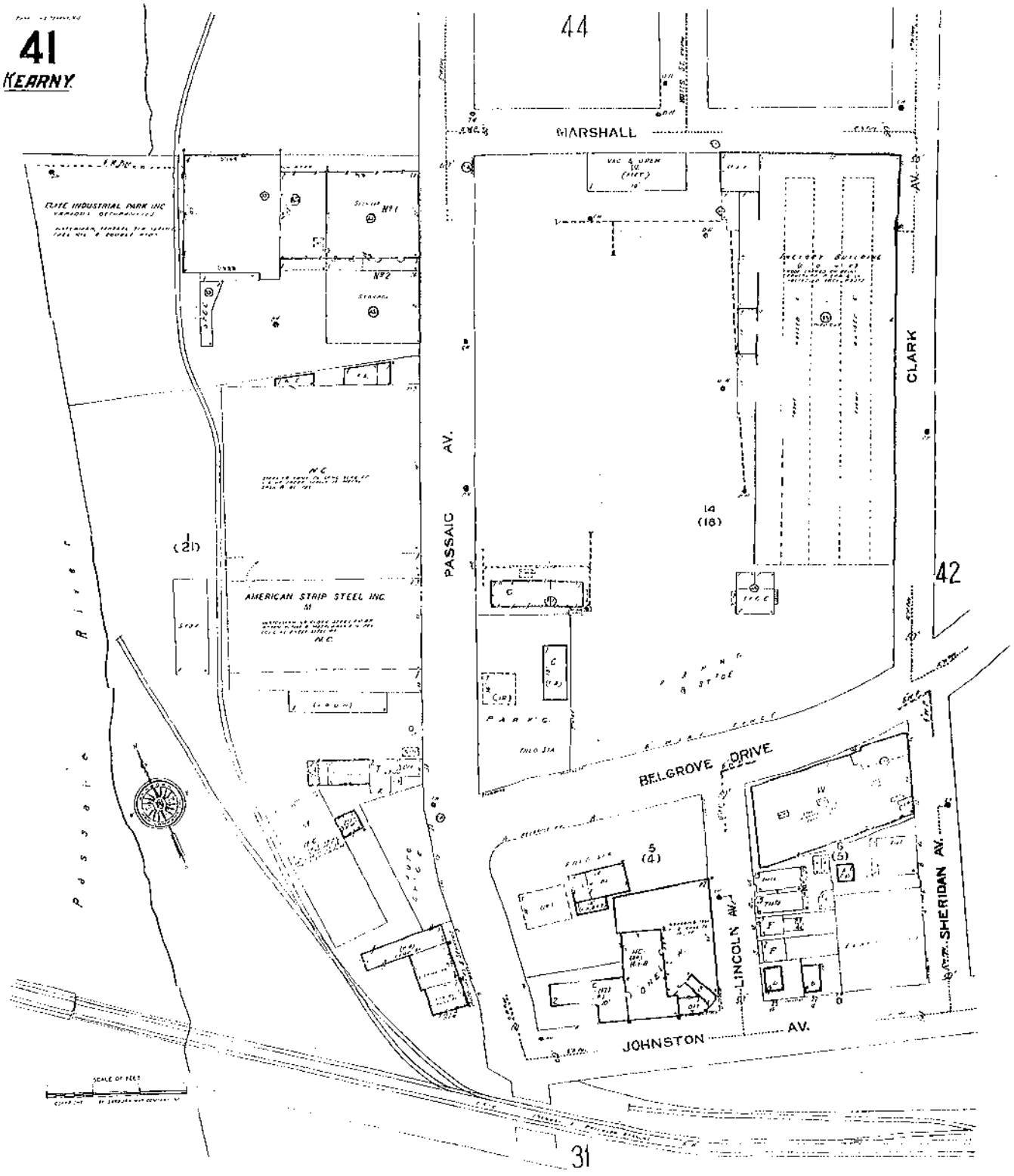






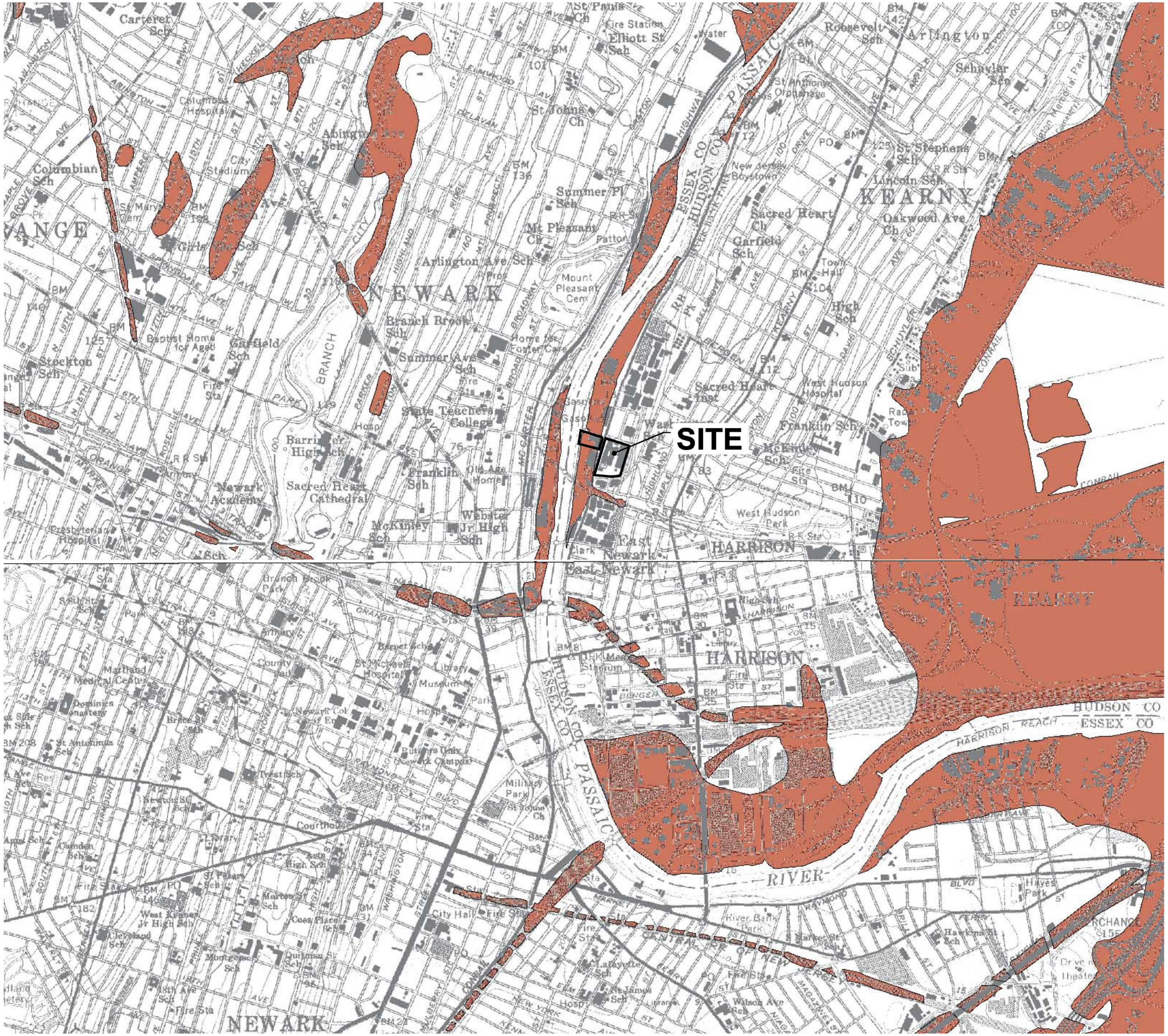






APPENDIX B

Historic Fill of the Orange Quadrangle – Historic Fill Map HFM-41



Historic Fill

Non-Fill Area

SOURCES:

HISTORIC FILL OF THE ORANGE QUADRANGLE 2004
HISTORIC FILL MAP HFM-41

HISTORIC FILL OF THE ELIZABETH QUADRANGLE 2004
HISTORIC FILL MAP HFM-52

NJDEP LAND USE MANAGEMENT, NEW JERSEY GEOLOGICAL SURVEY.

12°
MAGNETIC NORTH
TRUE NORTH
APPROXIMATE MEAN DECLINATION, 1998

0 2000 FT.
APPROXIMATE SCALE

TRC ENVIRONMENTAL CORP.
57 East Willow Street
Millburn, New Jersey 07041

HISTORIC FILL

AMERICAN MODERN METALS CO. – KEARNY, NEW JERSEY

JOB NO. 1894-154733

DMP/LB	DATE: JULY 2009	FIGURE:

FILE: M:\CAD FILES\WORK\1894\1894-12.DWG, DATE: 07/07/2009 10:06:44AM

APPENDIX C

Table 4-2: Summary of Target Contaminant Concentrations in Typical Historic Fill Material

highest total petroleum hydrocarbon levels, and field screening for volatile organic compounds shall be conducted during the installation of all exploratory borings and test pits with volatile organic laboratory analysis performed on all samples with elevated field instrument measurements (greater than five times background);

(2) Any other fill material shall be analyzed for total petroleum hydrocarbon in all samples, and Priority Pollutant plus forty analysis or EPA Target Compound List/Target Analyte List analysis shall be conducted for 25 percent of all samples;

(3) In addition to contaminant analysis required in (b)3iii(1) and (2) above, samples shall also be analyzed for any other suspected contaminants based on diligent inquiry of the origin of the fill material and site history; and

(4) If more than one type of historic fill material is encountered in any boring or test pit, one sample is required for each type of fill material encountered. For example, if ash and demolition debris are encountered in the same boring, one sample of each is required from that boring; and

4. Areas of concern located in historic fill material shall be investigated independently of the historic fill material. To differentiate between contaminants in fill and those from site discharges, an evaluation of the contaminant type and concentration gradient in each area of concern and the contaminant distribution in the fill shall be conducted. If this evaluation is not conclusive the Department may require additional data or information;

5. If at any time during the remedial investigation of fill material the person responsible for conducting the remediation encounters materials that do not meet the definition of historic fill material because it includes material which is substantially chromate chemical production waste or any other chemical production waste or waste from processing of metal or mineral ores, residues, slag or tailings, free and/or residual product, as determined pursuant to N.J.A.C. 7:26E–2.1(a)11, or containerized waste, the remediation of each such area shall be conducted as a separate area(s) of concern pursuant to N.J.A.C. 7:26E–4; and

6. An appropriate number of ground water samples (minimum of one sample) are required when a high degree of certainty is needed to document that ground water is not contaminated, including, without limitation, if the historic fill site is in an area where ground water is used for potable water. Any ground water sampling shall be conducted pursuant to N.J.A.C. 7:26E–3.7(c).

TABLE 4–2
Summary of Target Contaminant Concentrations in Typical Historic Fill Material (mg/kg)

Contaminant (ppm)	Maximum	Average
Benzo(a)anthracene	160	1.37
Benzo(a)pyrene	120	1.89
Benzo(b)fluoranthene	110	1.91
Benzo(k)fluoranthene	93	1.79
Indeno(1,2,3-cd)pyrene	67	1.41
Dibenz(a,h)anthracene	25	1.24
Arsenic	1098	13.15
Beryllium	80	1.23
Cadmium	510	11.15
Lead	10700	574
Zinc	10900	575

Amended by R.1997 d.124, effective May 19, 1997 (operative July 18, 1997; 7:26E–4.6(a)2 operative November 19, 1997).
See: 28 N.J.R. 1098(a) 28 N.J.R. 2298(a), 29 N.J.R. 2278(b).
Added "and historic fill" to section heading; in (a), substituted "ISRA" for "ECRA" and "as follows:" for "which may contain contaminants above the applicable remediation standards,"; recodified former (b) through (e) as (a)1 through 4; in (a)3, inserted reference to Geographic Information System and amended N.J.A.C. reference; in (a)4, substituted "responsible for conducting the remediation" for "responsible for the investigation"; and inserted new (b).

7:26E–4.7 Remedial investigation of ecological receptors

(a) If further ecological investigation is required pursuant to N.J.A.C. 7:26E–3.11(a)4, additional investigation shall be conducted during the remedial investigation to characterize the extent of contamination along contaminant migration pathways and within an environmentally sensitive natural resources. Neither an ecological investigation nor an ecological risk assessment is required for contaminated ground water, but see N.J.A.C. 7:26E–4.8(c)12 for reporting requirements. Ecological investigations and risk assessments shall be conducted by a person experienced in the use of techniques and methodologies for conducting ecological risk assessments in accordance with EPA guidance. Ecological investigations and risk assessments shall be conducted in accordance with EPA and other Federal guidance, as applicable, including, without limitation, the following, incorporated herein by reference:

1. "Ecological Assessment of Hazardous Waste Sites: A Field and Laboratory Reference," EPA/60013–89/013;

2. "Risk Assessment Guidance for Superfund, Volume II, Environmental Evaluation Manual," EPA/540/1–89/001, and the associated supplementary guidance Ecological Update Series—Volumes 2 and 4; and

3. "Framework for Ecological Risk Assessment," EPA/630/R–92/001;

4. Eisler, R., "Contaminant Hazard Reviews," Fish and Wildlife Service, U.S. Department of Interior, various dates;

5. EPA, "Wildlife Exposure Factors Handbook," Vol. I and II, EPA 600/R–93/187a, b;

6. EPA, "BTAG Forum," Intermittent Bulletin published by USEPA, Office of Emergency and Remedial Response;

APPENDIX D-1

River Remediation Cost Projections

APPENDIX D-1
Passaic River Sediment Remediation Cost Estimates
KIA Site, Kearny, NJ

Basis:

Sediment Volume - Impacted Sediment Quantity Basis:

Total Soil Transport to River (Kg/year)=	1,000	
Duration of Sediment Discharge to River (years):	113	(duration between end 2012 and 1900)
Total Weight of Sediment (Kg):	113,000	
Total Volume of Sediments (CY):	90	

Professional & Misc. Fees	Rate			Cost	
Personnel Mobilization	2.5%			$	1,900
Mobilization	3.0%			$	2,300
De-mobilization	3.0%			$	2,300
Subtotal				*$*	*7,000*
Pre-Design Investigations	1	ls	$30,000	*$*	*30,000*
Sediment Excavation, Stabilization, Dewatering & Disposal (~50 CY)					
Sediment Excavation:	Quantity	Unit	Unit Cost	Cost	
Barge	1	ls	$ 5,000	$	5,000
Dredgeing/Removal	90	CY	$ 25.00	$	2,250
Subtotal:				*$*	*8,000*
Stabilization	Quantity	Unit	Unit Cost	Cost	
Stabilization of Sediment	90	CY	$ 17.00	$	1,530
Water Treatment/Management	1	Week	$ 8,000.00	$	8,000
Subtotal:				*$*	*10,000*
Transportation and Disposal	Quantity	Unit	Unit Cost	Cost	
Transportation and Disposal	151	Ton	$ 75.00	$	11,340
Subtotal:				*$*	*11,000*
Survey & Laboratory Analysis	Quantity	Unit	Unit Cost	Cost	
Pre-excavation Survey	1	Days	$ 1,750.00	$	1,750
Pre-excavation Sampling	10	Sample	$ 500.00	$	5,000
Post Excavation Sampling	10	Sample	$ 500.00	$	5,000
Post Excavation Survey	1	Days	$ 1,750.00	$	1,750
Waste Characterization	1	Sample	$ 1,000.00	$	1,000
Subtotal:				*$*	*15,000*
Project Subtotal:				**$**	**81,000**
Contingency (20%)	20%			$	17,000
Project Subtotal w/ Contingency:				**$**	**98,000**

Professional & Engineering Fees	Rate	Cost		
Construction Management	8.0%	$ 7,840		
Project Management	8.0%	$ 7,840		
Remedial Design and Permitting	30.0%	$ 29,400		
RAW/RAR		$ 25,000		
Subtotal - Professional & Engineering			$	70,000
Regulatory Oversight Fees	10.0%		$	17,000
Project Total			**$**	**185,000**

Unit Cost Basis:

- RS Means Environmental Remediation Cost Data (ECHOS). 12th Annual Edition, 2006. Adjusted for location and inflation.
- Northern Bayshore Dredged Material Management Plan Raritan and Sandy Hook Bays Monmouth County, NJ (06/2008)
- USEPA 2007. Lower Passaic River Restoration Project- Draft Source Control Early Aaction, Focused Feasibility Study.
- USEPA 2009. Lower Passaic Restoration Project- Revision and
- USACOE - DMMP for the Port of NY & NJ:Technical Appendix, 10/8/98
- EPA 540-R-00-002 "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study"

APPENDIX D-2

HEA Calculations for River Restoration & Compensatory Projects

APPENDIX D-2
HABITAT EQUIVALENCE ANALYSIS
APPORTIONMENT BASIS - EQUIVALENT SITE SEDIMENT AREA BASIS
KIA Site, Kearny, NJ

		Area Affected			Areas of Compensation	
Year	Discount Factor	Total PAH concentration (mg/kg)	Total % Injury	Discounted Service Acre-Years Lost	Total % Recovery	Discounted Service Gain per acre from Restoration (acre-year)
1981	2.29	42.76	75.0%	0.020	0%	0.000
1982	2.22	42.76	75.0%	0.019	0%	0.000
1983	2.16	42.76	75.0%	0.019	0%	0.000
1984	2.09	42.76	75.0%	0.018	0%	0.000
1985	2.03	42.76	75.0%	0.018	0%	0.000
1986	1.97	42.76	75.0%	0.017	0%	0.000
1987	1.92	42.76	75.0%	0.017	0%	0.000
1988	1.86	42.76	75.0%	0.016	0%	0.000
1989	1.81	42.76	75.0%	0.016	0%	0.000
1990	1.75	42.76	75.0%	0.015	0%	0.000
1991	1.70	42.76	75.0%	0.015	0%	0.000
1992	1.65	42.76	75.0%	0.014	0%	0.000
1993	1.60	42.76	75.0%	0.014	0%	0.000
1994	1.56	42.76	75.0%	0.014	0%	0.000
1995	1.51	42.76	75.0%	0.013	0%	0.000
1996	1.47	42.76	75.0%	0.013	0%	0.000
1997	1.43	42.76	75.0%	0.012	0%	0.000
1998	1.38	42.76	75.0%	0.012	0%	0.000
1999	1.34	42.76	75.0%	0.012	0%	0.000
2000	1.30	42.76	75.0%	0.011	0%	0.000
2001	1.27	42.76	75.0%	0.011	0%	0.000
2002	1.23	42.76	75.0%	0.011	0%	0.000
2003	1.19	42.76	75.0%	0.010	0%	0.000
2004	1.16	42.76	75.0%	0.010	0%	0.000
2005	1.13	42.76	75.0%	0.010	0%	0.000
2006	1.09	42.76	75.0%	0.010	0%	0.000
2007	1.06	42.76	75.0%	0.009	0%	0.000
2008	1.03	42.76	75.0%	0.009	0%	0.000
2009	1.00	42.76	75.0%	0.009	0%	0.000
2010	0.97	42.76	75.0%	0.008	90%	0.874
2011	0.94	42.76	75.0%	0.008	100%	0.943
2012	0.92	42.76	75.0%	0.008	100%	0.915
2013	0.89	8.55	15.0%	0.002	100%	0.888
2014	0.86	1.71	3.0%	0.00030	100%	0.863
2015	0.84	0.34	0.6%	0.00006	100%	0.837
2016	0.81	0.07	0.1%	0.000011	100%	0.813
2017	0.79	0.01	0.02%	0.000002	100%	0.789
2018	0.77	0.003	0.005%	0.0000004	100%	0.766
2019	0.74	0.00	0.0%	0.000	100%	0.744
2020	0.72	0.00	0.0%	0.000	100%	0.722
2021	0.70	0.00	0.0%	0.000	100%	0.701
2022	0.68	0.00	0.0%	0.000	100%	0.681
2023	0.66	0.00	0.0%	0.000	100%	0.661
2024	0.64	0.00	0.0%	0.000	100%	0.642
2025	0.62	0.00	0.0%	0.000	100%	0.623
2026	0.61	0.00	0.0%	0.000	100%	0.605
2027	0.59	0.00	0.0%	0.000	100%	0.587
2028	0.57	0.00	0.0%	0.000	100%	0.570
2029	0.55	0.00	0.0%	0.000	100%	0.554
2030	0.54	0.00	0.0%	0.000	100%	0.538
2031	0.52	0.00	0.0%	0.000	100%	0.522
2032	0.51	0.00	0.0%	0.000	100%	0.507
2033	0.49	0.00	0.0%	0.000	100%	0.492
2034	0.48	0.00	0.0%	0.000	100%	0.478
2035	0.46	0.00	0.0%	0.000	100%	0.464
2036	0.45	0.00	0.0%	0.000	100%	0.450
2037	0.44	0.00	0.0%	0.000	100%	0.437
2038	0.42	0.00	0.0%	0.000	100%	0.424
2039	0.41	0.00	0.0%	0.000	100%	0.412

APPENDIX D-2
HABITAT EQUIVALENCE ANALYSIS
APPORTIONMENT BASIS - EQUIVALENT SITE SEDIMENT AREA BASIS
KIA Site, Kearny, NJ

		Area Affected			Areas of Compensation	
Year	Discount Factor	Total PAH concentration (mg/kg)	Total % Injury	Discounted Service Acre-Years Lost	Total % Recovery	Discounted Service Gain per acre from Restoration (acre-year)
2040	0.40	0.00	0.0%	0.000	100%	0.400
			Total	**0.4**		**20**

Replacement project size = ***0.02***

= Sum (Discounted Service-Acre-years Lost)/Sum (Discounted Service Gain per Acre from Restoration)

P =	**1.00**		
LS =	0.25		
R =	175.00		
C =	0.02		
K =	0.43		
Universal Soil Loss =	0.38	tons/acres/year	USL = PRCKLS
Uncapped Site Area =	3.00	acres	Area
Total Soil Transport to River =	1,000	kg/year	STR = USL x Area
Average PAH Concentration=	42.76	mg/kg	
Total PAH Loading to River =	0.04	kg/year	$LOAD_{total} = C_{PAH}$xUSL x Area
Low Passaic River area =	500.00	acres	
Total Sediment Mass =	43,000,000	kg	
Site Sediment Load Proportion to River =	0.00002	1/year	$Sload\% = SMass_{river}/MASS_{total}$
Site Sediment portion of Passaic River =	0.012	acres	$SSArea_{river}$=Sload% x $Area_{river}$
Assumed Rate of Injury (*) =	75%		

(*) Based on Sediment Quality Benchmarks (SQB) traditionally used by Trustees: benchmark of 22.8 mg/kg for PAH, a level which would cause about 50% damage to aquatic ecosystems (MacDonald et al, 2000).

Baseline Year =	2009	
Damage/Claim Start Year =	1981	
Total Damaged Area by PAH & Lead =	0.4	acres-years
Replacement project size =	***0.02***	***Acres***